

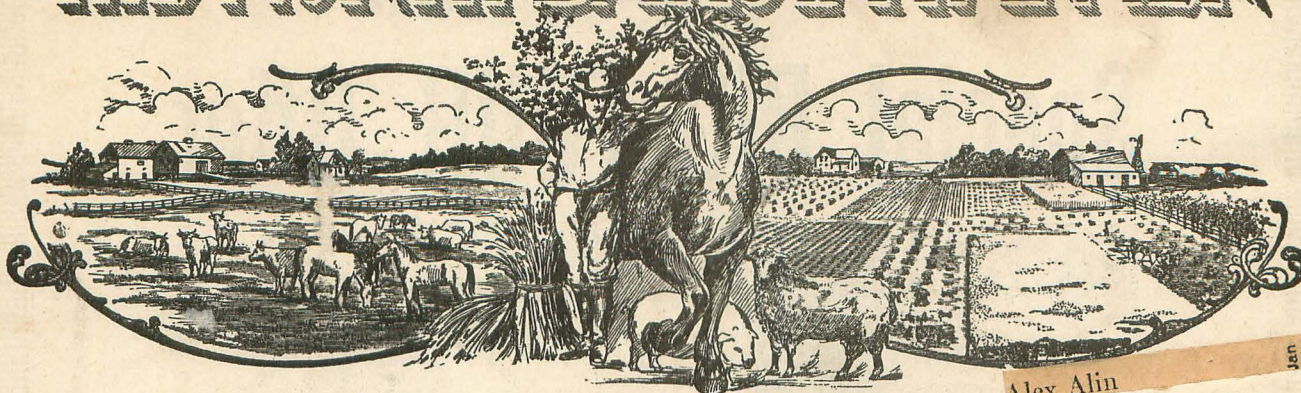
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# THE NORTH DAKOTA FARMER



"THE NORTH DAKOTA FARMER FOR NORTH DAKOTA FARMERS"

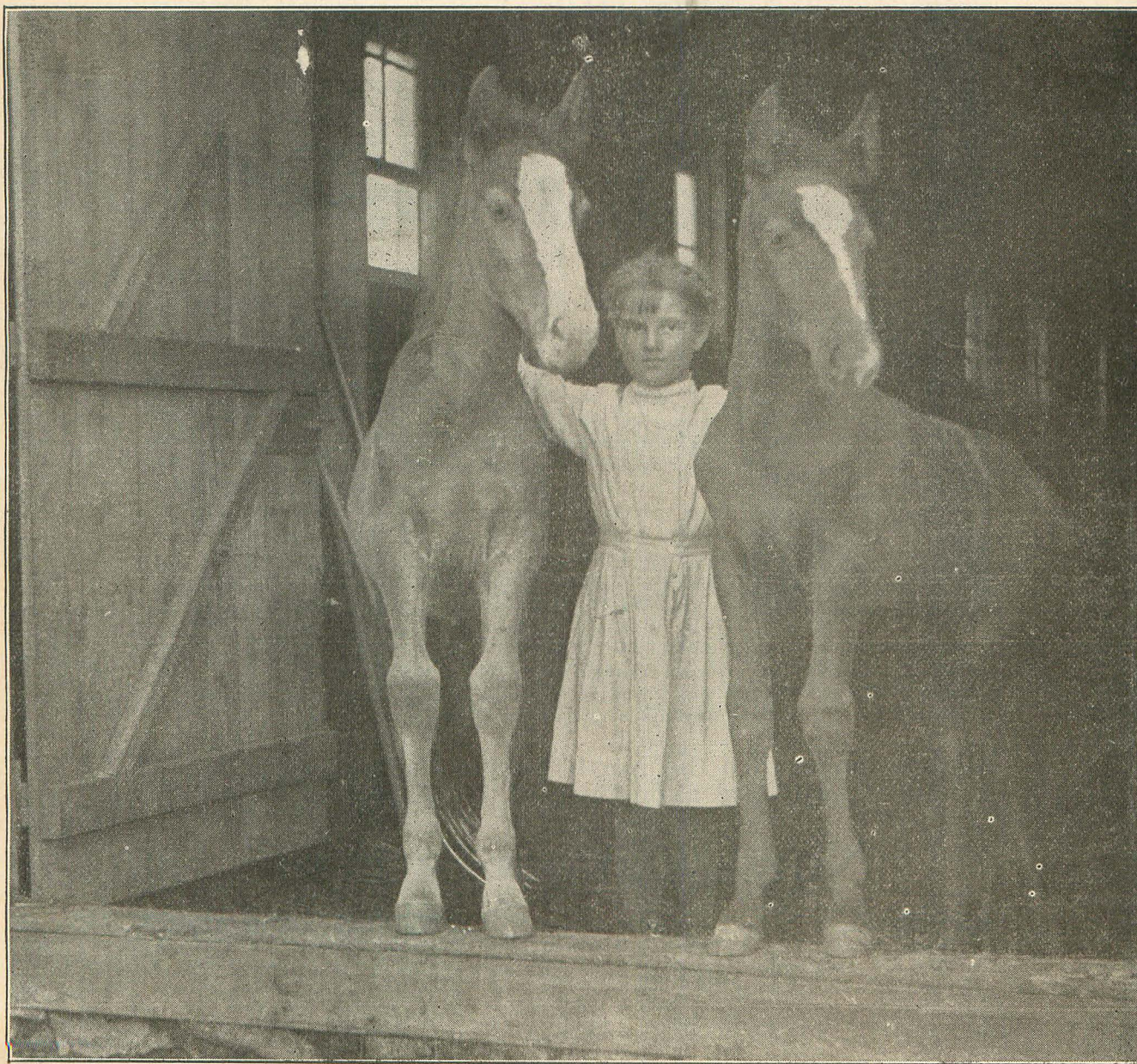
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Vol. 16, No. 5

Lisbon, North Dakota, November 15, 1914

50 Cents A Year



PETS AND PROFITS

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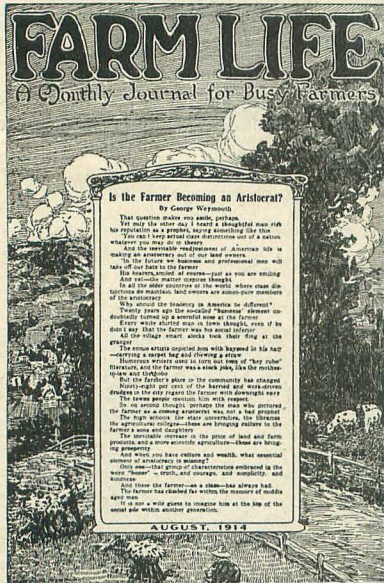
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# THE NORTH DAKOTA FARMER

Vol. 16, No. 5

LISBON N. D., NOVEMBER 15, 1914

50 Cents a Year

## What the Government is Doing for the Farmer

Address of the Secretary of Agriculture before the National Dairy Show  
Association, Chicago, Ill., Oct. 26, 1914

I am not here today to discuss the technical problems of dairying or the livestock situation specifically, and especially not to discuss either of these topics in their technical bearings. Others much more expert in such matters will deal with these problems. I am here to consider with you certain broad aspects of agriculture and of rural life in this nation; to indicate the interest of the Federal government in their betterment, and to tell you as fully as time will permit what the Government is doing to help the farmer and, therefore, to make the nation prosperous. It is a truism that the advancement of farming and the betterment of rural life lie at the very root of our prosperity and strength as a nation. Today, all the people, urban and rural alike, are keenly interested in the supply of the necessities of life, and recognize the supreme importance of making agriculture efficient and profitable and rural life comfortable, healthful, pleasurable, and attractive. More attention and more intelligent thinking have been directed to the study of the fundamental problems in rural economics in the last few years than in any preceding decade, and it may be safely asserted that in the last two years more significant legislative measures have been enacted or pushed farther to the stage of completion than in any similar period in the history of the nation. It is vastly significant that attention is no longer exclusively directed merely to the primary problems of production. The center of interest, as a matter of fact, has tended to shift, and the rural life problem has begun to be conceived, as it should be—as a very broad and complex one.

Up to the last two or three years, unquestionably attention was directed

too exclusively merely to the production side of rural life. The slogan was "make two blades of grass grow where only one grew before" and individualism characterized thinking and acting. Obviously, there is more to rural life than the mere increase of crops and animals, important as this is; more even than increase in production and the finding of markets; more than a matter of profits and even of justice in distribution; and to limit the attack on the rural life problem merely to these phases of it is inadequate and wasteful. It is necessary to look at this side of our national economy in its larger aspects as well, and while not neglecting the older forms of activity to do all in our power to organize rural life, to develop the moral, the intellectual, and the broader economic, governmental, and social interests. For, in the rural district, no less than in the urban district, it is life and that more abundantly which we are interested in, and to which all the material things must minister, and certainly the time has come to bring it about that all the fruits of modern civilization shall not accrue to the towns and cities. The neglect of rural life by the nation has not been conscious or willful. We have been so bent on building up great industrial centers, in rivaling nations of the world not so fortunately circumstanced agriculturally, in manufacturing, fostering it by every natural and artificial device we could think of—so busy trying to make each city larger by a half million or more people for the next census, that we have overlooked the very foundations of our industrial existence. It has been assumed that we have had a natural monopoly in agriculture, that it could take care of itself, and for the most part we have cheerfully left

it to do so; and, too, recklessness and waste have been incident to our breathless conquest of a continent. And so, as the President recently said: "It has, singularly enough, come to pass that we have allowed the industry of our farms to lag behind the other activities of the country in its development. \* \* \* Our thoughts may ordinarily be concentrated upon the cities and the hives of industry, upon the cries of the crowded market place and the clangor of the factory, but it is from the quiet interspaces of the open valleys and the free hillsides that we draw the sources of life and of prosperity, from the farm and the ranch, from the forest and mine. Without these every street would be silent, every office deserted, every factory fallen into disrepair."

With all our efforts, while we witness an increasing diversification of agriculture and both a relative and absolute increase in many of our important lines of production, such as wheat, forage crops, fruits, dairy products, and poultry, we still note not only a relative but also an absolute decrease in a number of our important staple food products such as corn and meats. In the former, in the last 15 years, there has been no substantial advance. In cattle, sheep, and hogs, there has been an absolute decline—in cattle from the census year 1899-1909 of from 50 million head to 40 million; in sheep of from 61 million to 52 million; of hogs from 63 million to 58 million, while population has increased 16 million. Remember that this situation appears not in a crowded country but in one which is still in a measure being pioneered; in one in which, with 935 million acres of arable land, not over 400 million or 45% is under cultivation; in one in which the population



per square mile does not exceed 31 and ranges from .7 of one per cent in Nevada to 508 in Rhode Island. What is the trouble? Is it that the American farmer has not as much intelligence or as high a degree of efficiency as those of other nations? I would resent on behalf of the American farmer such an imputation and the facts contradict it. It is true he does not produce as much per acre as the farmer in a number of civilized nations—but production per acre is not our standard. It is production per person engaged in agriculture and by this test he is from two to six times as efficient as most of his competitors. And I have not the slightest doubt that the ensuing years will make it clearer that the American farmers can hold their own in free competition with those of the rest of the world and not only retain in large measure a monopoly of his own rapidly growing home market but also supply a considerable part of the food-stuffs consumed by the world. Relatively speaking, extensive farming is still economically the sound program for the American farmer, but it is becoming decreasingly so; and the aim must be, while maintaining supremacy in production per man, to assert supremacy in production per acre. The continued solution of the problem here suggested is one which now seriously engages the attention of the federal government as well as the governments of the states.

It is clear that we have been considering the meat supply of the nation too exclusively in terms of the big ranch and of the large animals. Obviously it is important that we should continue to help the cattleman and to develop the ranch, and no pains will be spared to do this. The Government is now spending money to develop the livestock industry in connection with the reclamation projects, and the Department is asking for more. It is attacking the problem of overstocking and overgrazing on the range and in the national forests which furnish pasture for over one million six hundred thousand cattle and horses and over seven million six hundred thousand sheep and goats. It is demonstrating that under systematic management that grazing value of land can be restored and increased and can produce heavier animals even with an increased number, and that under proper management the range can be improved faster in use than in idleness.

Every effective thing that may be done to stimulate the livestock interests in general will, of necessity, react favorably upon the great industry, the dairy industry, in which

you are immediately and specially concerned. The importance of this great interest the Government fully appreciates, involving as it does the handling of twenty-one millions of cows, an annual product of approximately six hundred millions of dollars in value, more than half a billion pounds of butter, half a billion pounds of condensed milk, and a third of a billion pounds of cheese. It is needless for me to tell you that dairying has made marked advance in recent years, but there is much to be done and the Government is making every effort to assist. It is studying how to reduce cost and to eliminate waste, to develop in those concerned careful business habits, the keeping of exact records and the definite knowledge each day of how their business stands. It is urging the grading of all dairy products, the elimination of waste in milk delivery, the organization of the milk supply, the extension of cooperation in buying and selling, and the extermination of disease in cows, especially of tuberculosis. Along these lines lies the hope of development and profit both to the producer and consumer.

Within the year Congress has enacted a measure of even vaster significance and greater consequence. I refer to the Smith-Lever Extension Bill, which, in my judgment, is one of the most significant educational measures ever adopted by any government. It recognizes a new class of pupils—a class composed of men and women working at their daily tasks on the farm. The Government takes the adult farmer and farm woman, as well as the farm boy and girl, as its pupils. It provides for an expenditure of over eight millions of dollars, partly by the states. It incorporates the most efficient method of conveying information to the farmer, and thru the healthful process of co-operation between the state and the nation, places the brains of these two great agencies at his disposal; insures efficiency, and eliminates waste and friction. I yield to no man my appreciation of the value of scientific investigation and research, but I am convinced that the great task confronting us now for the betterment of agriculture is to bring to the average farmer what the experts and the best farmers know and to induce them to apply it. If we could secure this we should revolutionize agriculture; and this is the object of the Smith-Lever Bill. It aims to reach the farmer by personal contact, and above all, to bring assistance to the farm woman who has been too long neglected as a factor in the agricultural life of the nation.

Intimately involved in both the

production and distribution of products is the matter of good roads. Good roads are prerequisite not only to economical production and distribution but also to the furtherance of the educational, social, and sanitary life of the farming districts. The great need is for roads which shall get products from the farm to the nearest railway station and enable the farmer to haul when he can not be busy about his sowing and reaping, and to haul at a lower rate. The railway will continue for an indefinite time to be the national highway. The emphasis is needed on the community road. It is estimated that it costs twenty-three cents per ton mile to haul under existing conditions on the country road, and that this could be reduced by half if the roads were improved. The question is one partly, of course, of means or of funds, but even more largely of methods, of instrumentalities, and of administration. The nation today is spending annually the equivalent of more than two hundred millions of dollars for roads, an enormous increase in the last decade. Much of this is directed by local supervisors and it is estimated by experts that of the amount so directed anywhere from thirty to forty per cent is, relatively speaking, wasted or misdirected. The first requisite, therefore, is for efficient expenditure and administration, and so far as the Federal government is concerned, to project it into the situation so as to safeguard the expenditure and to perfect the administration. The Office of Public Roads is at present doing everything in its power to promote the economical building of good roads, and especially to assist in the development of proper administration. The difficulties are presented mainly in the sphere of state and local administration. Less than half the states at present have an expert highway commission, and none have expert county commissioners. If direct Federal aid is to be extended it should be done only under such conditions as will guarantee a dollar's result for every dollar of expenditure. It is clearly undesirable to discourage state and local initiative. Cooperation between the state and the Federal government is requisite. The state should be the lowest unit with which the Federal agency should deal, and the representative in every state should be an expert highway commission. An automatic check to assaults on the Federal treasury should be provided, and the requirement that each state makes available at least twice as much as is appropriated by the Federal government should be imposed. If there were the further provision that



the Federal funds should be limited to construction projects and that before Federal money is made available for any projects, those projects shall have been mutually agreed upon by the Federal agency and the State Highway Commission, with clear understanding as to methods of construction, specifications, materials, and the development of a state system, great benefits might result and dangers would be reduced to a minimum. This same principle of co-operation is embodied in the Smith-Lever Extension Bill; and, in my own opinion, in intelligent cooperation of this sort many of the problems which are presented by our dual form of Government will find solution.

Nothing short of a successful attempt to secure these larger results in the rural life of the nation, to organize it, to make it profitable, healthful, comfortable, and attractive, can satisfy any thoughtful and patriotic man. It is the only sure way of developing and retaining in the rural districts of the nation an adequate number of efficient and contented people. That the thought and action of the nation must be along these lines is made clear by the facts I have recited and by the further fact that while the population of the nation in the last 15 years has increased 23 millions, the strictly rural districts have shown an increase of less than 6 millions. We cannot neglect the higher things to which the material minister and which if secured would render

much of our other effort unnecessary. The greatest undeveloped resource of any community is its people, and if we devoted more attention to the conservation and development of the people we should be relieved of much of our concern for the conservation and development of our natural resources. An awakening of the mental and spiritual faculties is prerequisite to the success of any educational enterprise, and therefore along with our attempts directly to increase the production of material things. We must minister to the minds and spirits of the rural population. In short, we must see to it that the finer results and the higher things of civilization are not the peculiar possession of urban peoples,—that they do not pass by or over our struggling rural masses. We must see to it that there is within reach of every country boy and girl an opportunity for a sound elementary and secondary school training, that the rural family be protected in its health against the ravages of insects and of disease; that the load be lifted in some measure from the struggling women of the farm, and that the wholesome social attractions of life be made more freely to abound. Any expenditure of effort or money in this direction will not be a burden but an investment, and with such protection, the farmers of this nation need not fear the competition of the world and the nation need not fear for its permanency.

Notwithstanding, a satisfactory crop in the main has been harvested the past year; yet the earlier indications promised, in many sections, more than twice the yield that was actually realized. Everything seems to point, therefore, to the end of profitable all-wheat farming in North Dakota. And it is well; for common sense should teach intelligent people that no soil can be drawn upon annually during long periods of time and continue to respond favorably without receiving adequate compensation. For all-wheat farming there is no adequate compensation. It is all take with no give. Moreover, the more skillful the farm management, naturally the larger yields, and consequently the sooner the productivity of the soil will be reduced to its minimum capacity for yielding crops.

We may well boast of the wearing quality of our soils; for no country can excel their productiveness over a longer period without receiving any sort of fertilizer. But the best soil on earth has its limitations. Ours is no exception. As well expect a team to work indefinitely without water and food as to expect soil to produce continuously without replenishing the essential elements drawn from it by the growing crops.

The fact, therefore, that all indications point toward the end of profitable all-wheat farming does not in the least slander the state. Rather, it proves that North Dakota, like southern Minnesota and Iowa, has something far better in store than exclusive dependence in wheat—something less risky and that will prove far more profitable, and moreover instead of wearing out and wasting the heritage of our children, the new system of farm management will build up the soil and make it more and more productive.

Nothing can be more discouraging than to see great fields of grain that give promise of twenty or thirty bushels per acre, suddenly collapse and actually strain the farmer's judgment as to whether it will better pay to harvest or burn the crop.

There are discouragements, of course, connected with breeding and feeding livestock, but the evils can more readily be overcome. In other words the farmer can more readily command the situation. He is not so helpless, is not so utterly dependent upon the elements. It requires more brains to practice diversified farming, it is true, but who can command more brains on occasion than the farmer? The fact that the pioneer farmer pursued the line of least resistance in capturing the natural wealth of the country does

## A Change in Farm Management Inevitable

By President J. H. Worst, N. D. A. C.

The poet says, "Learn to labor and to wait." The farmers of North Dakota and of the Northwest generally have labored long and waited patiently with a fair degree of success. Those conversant with the fundamental principles underlying agriculture have "waited" long to see those changes made in farm management which would result in larger and surer profits for the husbandman and the assurance of a more permanent agriculture. The time has arrived, however, when, without any disparagement of the agricultural possibilities of the state, the best judgment of the best farmers is against relying upon small grain crops, especially wheat, for paying off the mortgage or increasing the family income. This must not be construed as giving the

state a financial black eye. Far from it. But as indicated by the experience of other states with somewhat similar soil and climatic conditions, we also must substitute mixed farming and livestock for the all-wheat crop. The profits that will be assured on account of such change will more than square with the increased thought and labor involved in diversified farming as against all-wheat farming.

Where arguments fail in bringing about rotation of crops and diversified farming, natural agencies are at work which will convince the most skeptical. Insect and fungous enemies, hail-storm, hot days, and weeds, to say nothing of depleted soil fertility, will put up such arguments as will either convert or break the average farmer.



not signify that he was lacking in judgment.

The gambling spirit incident to most adventurers may cause the pioneer farmer to dally at wheat-farming too long for his own or his country's good; but as hinted at a moment since, the little bugs or worms or the microscopic fungi will finally get him into the mood for using his brains for all they are worth; for the farmer, like other peoples, wants to be on the right side of things.

There is no question but that the profits of farming can be very greatly increased. By practicing diversified farming the yields of grain could easily be doubled. The livestock in-

terests could also be greatly increased on account of the better yields of grain and forage and the element of chance thus greatly lessened.

The farmer at best has to take many chances, but uncertainty should be eliminated just as far as a surer thing can be substituted for what is by nature a gamble. Unquestionably diversified farming is a surer venture than to pin the hope of prosperity upon a single crop. The sooner, therefore, that livestock and diversified farming become general, the sooner will the farmers of the state enter upon a period of assured prosperity.

#### BUREAU OF CROP ESTIMATES, IN COOPERATION WITH WEATHER BUREAU, UNITED STATES DEPARTMENT OF AGRICULTURE

A summary of the preliminary estimates of production this year, and final estimates last year, of important products, and farm prices November 1, are given below: Production in thousands, i. e., 000 omitted.

CROPS		North Dakota		United States	
		Produc- tion.	Price Nov. 1	Produc- tion.	Price Nov. 1
Corn.....	Bushels, 1914....	13,100	.60	2,710,000	\$.697
	Bushels, 1913 ..	10,800	.47	2,446,988	.707
Wheat.....	Bushels, 1914....	83,049	.97	891,950	.962
	Bushels, 1913....	78,855	.72	763,380	.770
Oats	Bushels, 1914....	64,904	.36	1,139,741	.425
	Bushels, 1913....	57,825	.29	1,121,768	.379
Barley	Bushels, 1914....	26,520	.42	196,568	.513
	Bushels, 1913....	25,500	.42	178,189	.547
Rye]	Bushels, 1914....	2,240	.75	42,664	.806
	Bushels, 1913....	1,800	.48	41,381	6.32
Potatoes.....	Bushels, 1914....	6,590	.40	406,000	.540
	Bushels, 1913....	5,100	.52	331,525	.696
Hay.....	Tons, 1914.....	528	\$5.00	68,604	\$11.70
	Tons, 1913.....	388	5.80	64,116	12.26
Flaxseed.....	Bushels, 1914....	7,060	1.20	16,000	\$1.19
	Bushels, 1913....	7,200	1.20	17,853	\$1.19
Clover Seed: Production, % of full crop, 1914: 80;				70.2	*\$8.24
Production, % of full crop, 1913: 80				70.2	*\$7.00

\*Price, October 15.

Printed and distributed by the Weather Bureau.

## From the Nation's Capital

By Guy E. Mitchell

### CAN WE FEED EUROPE?

Every once in a while some jubilant American will get up and shout at the top of his voice that America can feed the world, because we have had wonderful crop returns this year. As a matter of fact, we can't feed the world, we can't feed starving and devastated Europe, and we are not feeding ourselves quite as fat as we ought to. Some statistician has figured out that our appetites at home are able to take care of more than 95 per cent of the meat raised in the United States. He further found out that of every

\$100 of dairy products we produce \$18.38 goes abroad, but at the same time we import \$2, making a home consumption of nearly 84 per cent.

We practically consume our own production of poultry and eggs, huge as it is, amounting to \$600,000,000 a year. Last year we produced \$554,000,000 worth of vegetables, but we ate \$600,000,000. Feed Europe? Not with our vegetables. Even of fruits and nuts, with all our famous orchards, we imported \$17,000,000 more than we sold abroad.

It is true we have been able to sell grain to Europe in considerable quan-

ties. Last year we had about \$150,000,000 to spare. This year we have twice as much as that, but these figures, large as they look on paper, are only trifles, when it comes to "feeding the world."

### RURAL CREDITS BACKED BY COTTON FORCES

Rural credits legislation will be strongly pushed at the next session of Congress by some of the Southern members who are interested in relief for the cotton producers, as well as by a large contingent of members generally, who believe such legislation should be had. Congressman Henry, of Texas, stated that everything possible would be done next session to secure a comprehensive rural credits law as one of the best methods of aiding the solution of the troubles of the cotton producers.

"A comprehensive rural credits bill will be urged to the utmost from the beginning of the session next winter," said Mr. Henry. "It will be a bill which will aim at a rural credit system independent of the present national banking system. Nothing will be left undone from the time Congress meets in December to get cotton relief legislation. The South must have it. Conditions there are much worse than the people of the North realize. Night riders are already active in Texas burning gins and trying to prevent sales of cotton at less than 10 cents."

Mr. Henry said he intended to make speeches in the North, to farmers and commercial organizations to acquaint them with the true conditions.

### BUYING MARKET PRODUCE IN BULK

"Co-operative marketing, such as practiced in Holland, and which has been advocated in this country, will have its first trial down in Louisiana," said a prominent business man of Baton Rouge, who was in Washington the past week. "Associations have been formed for this purpose, and it is the intention of these to purchase all supplies for the citrus fruit and truck belt in bulk, the various planters buying their boxes, fertilizer, and implements thru the associations.

"This means the establishment of shipping points for truck and citrus fruits, where the planters will receive, as in the case of the strawberry districts, cash on the platform for their products, instead of being dependent on the market at some distant point. Part of this year's crop will be handled in this manner. This will give



the growers of the lower coast better prices and better handling facilities than ever before. Next year the entire output of fruit and truck of the lower coast will be marketed thru these associations.

"The organization of these associations marks the first step taken by the planters of the lower coast toward a system of profitable marketing of their crops, and means increased prosperity for them and lower prices for the consumers. Orange growers have estimated that on oranges alone there will be a saving of practically \$150,000 on this year's crop. It also means that with these associations in operation there will be no more cucumbers sold for \$1 a barrel on the coast, while the same product is selling at six for a quarter in the French market."

### EXPERIMENTS WITH TOP-DRESSING OF TIMOTHY

The New York Cornell Station has been making a series of tests in which field plats were subjected to a cropping rotation of timothy 3 years, corn, oats, and wheat each one year. Fertilizers or farm manure were applied to the timothy but not to any of the grain crops, different applications being used on different plats. The experiment has been conducted for 9 years. According to the report received by the Department of Agriculture, the results show that fertilization of the soil for timothy increases its productiveness for succeeding crops. The greatest benefit was derived by the corn crop, which immediately followed the timothy. The oat crop experienced the next greatest benefit, and the wheat least.

Tabulations of the financial gains demonstrate that the use of fairly large applications of fertilizers was profitable, resulting in as much as \$65 per acre net gain for the 6 years and giving a return of \$1.67 for every dollar invested in the fertilizer. Commercial fertilizers, while not superior to farm manure, were about equally effective. On grain crops commercial fertilizers are usually of less value than farm manure judiciously applied. This experiment indicates that it is good practice to apply commercial fertilizers to timothy and thus save the farm manure for other crops.

### TEST WITH POTATOES

A report has been received by the Department of Agriculture of tests made in Ireland in which potatoes were allowed to sprout before being planted. The average results obtained in every county in Ireland during the

10 years of the experiment, showed that sprouted seed yielded 12 tons and unsprouted seed 10 tons per acre. According to the tests the advantages of storing potatoes during the winter in sprouting boxes are as follows:

"(1) A substantial increase in yield; (2) planting may be deferred for a time in an unfavorable season without detriment to the crop; (3) several weeks' growth is secured in the boxes previous to planting; the first bud is preserved, which results in the crop making rapid growth when planted, enabling it to smother weeds; (4) the crop is usually ready for lifting several weeks before that from unsprouted seed; (5) seed potatoes can be safely and conveniently stored in boxes and easily examined for the removal of unsound tubers or for the detection of those of other varieties which may have been accidentally introduced."

The joke is on the publicity people of the Department of Agriculture. A few days ago they issued to the press, with release for publication October 31, a little item telling the amateur gardener how to protect his flowers from Jack Frost. Before the warning could be printed in the papers, on account of the release date, and almost simultaneous with its mailing by the Department, Washington, along with other eastern cities was visited by a mild Cold Wave and Jack Frost painted the vegetation a beautiful white. Many inquiries are now being made of the Agricultural Department people why the warning was not issued in time, or why the directions were not printed in midsummer while Jack Frost was in the vicinity of the North Pole.

On April 15, 1910, according to the United States Census Office, there were 598,047 farms on which there were sheep of shearing age, the number of such sheep being 39,644,000. The value of the wool clipped was \$45,670,000 in 1899 and \$65,472,000 in 1909. The most important state in the production of wool was Wyoming, with Montana, New Mexico, Ohio, California, Idaho, Oregon, and Texas ranking in order named.

### A BABCOCK TEST ON THE FIELDS

By Clyde A. Waugh, Mid-West Soil Improvement Committee

It was a wonderful herd of Jerseys. Every cow in the barn had a Register of Merit dam and many of them traced back to prize-winning stock for generations. Back of each cow in that great well-lighted stable hung a small square of cardboard in which

smaller squares were marked off to represent each day in the month. At the right hand side of each of these were other columns in which appeared the amount of grain and forage each cow had eaten during the month together with still other columns in which were shown the total number of pounds of milk produced, its tests, the total amount of butterfat and the net profit or the loss. It was a wonderful system and it enabled the dairyman to tell at a glance as to whether a cow deserved to stand in the herd or not.

We, the dairyman and the writer, went out over the farm. We looked at a field of corn. Its color was pale and it was slow in growing. In the clover field, we found the crop a bit spindling while there were spots on which it had killed out badly. The wheat was not up to standard. At last, the dairyman owner turned to me with a look of inquiry and asked, "What is the matter with these crops? They don't look right. If it was one of the cows, I could tell in a minute, but it isn't a cow and I'm up the stump bad," he continued.

"Do you know the fields as well as you do the cows?" the writer questioned by way of reply. "What kind of a ration do you feed them? Do they get enough food? Is their ration balanced? Do you keep track of them so that at the end of the season you can tell whether you lost or made on them as you can with those Jerseys? At the end of the season, do you weigh out your crops? Do you test them for maturity, for moisture content, for quality, for weight per bushel?" the writer further questioned.

"Why, I never thought of that," he explained by way of answer. "It's a sort of a Babcock test on the fields isn't it?" The talk was terminated by the whistle of an interurban car which the writer was compelled to board in order to make a certain train.

Last winter, the writer met the dairyman farmer at a state corn show. He was enthusiastic in his greeting and his first remark was, "I've been Babcocking my fields lately. See that ten-ear sample over there? It took the championship. It was hard work to get next to the dirt but now I know it nearly as well as the Jerseys. It takes pretty nearly as much feed for the crops as it does for the cows but it's just about the same way. Give the plants plenty to eat and they grow big. See how this corn tested out, it's as solid as a brick and there isn't a bit of excess water in it. The crop took five loads of manure and 300 pounds of high-grade fertilizer per acre but it yielded at the rate of ninety bushels of the finest corn I ever raised. It paid."



# Potatoes and Other Root Crops as Food

By C. F. Langworthy in U. S. Bulletin No. 295  
SEVENTH YEAR—DECEMBER

Among the products of the vegetable kingdom used for human food the cereals are undoubtedly the most important, but next to them must be placed the group of plants which during the favorable days of summer lay up for themselves a supply of reserve material in thickened roots or underground stems and bulbs. These plants belong to many different groups and have different habits and varied appearance, but from the standpoint of food value their common characteristic of producing underground parts filled with nutritious material makes it convenient and logical to group them together. In some cases it is a true root, such as the beet, in which the plant lays up its store; in others it is an underground stem as in the case of tubers like the potato, and again it is a bulb like the onion. Botanically, these distinctions are very important, but they have little bearing on the food value, and for the present purpose it is sufficiently accurate to speak of all such vegetables as "root crops."

These edible tuberous bulbs and roots divide themselves roughly into two main classes: Those in which the plant stores its food principally in the form of insoluble starch, and those in which a comparatively large proportion is in the form of sugar or some other soluble bodies. As a general rule vegetables of the latter group contain a larger proportion of water than the starchy tubers, etc., and are

therefore often called the succulent roots.

The succulent roots are less important as human food than the starchy ones. Beets, carrots, parsnips, turnips, and onions are the most common. Many of them are characterized by strong flavors and odors due to volatile oils which they contain. Like potatoes, they can be stored for months without serious deterioration, and being comparatively low-priced occupy an important place in the list of winter vegetables. Some highly flavored roots, such as the horseradish and ginger, serve mainly as condiments, their food value in the quantities in which they are used being too small to be of any practical importance.

The potato so far surpasses all other tubers and roots in importance that its composition and nutritive value have been carefully studied both in this country and in Europe. It will, therefore, be discussed in detail and in a measure considered as a type of all the other tubers and roots, especially the starchy group.

The potato, called in different regions white potato, Irish potato, English potato, or round potato, was first introduced into Europe between 1580 and 1585 by the Spaniards, and afterwards by the English about the time of the expeditions sent by Raleigh to the Virginia country. It is believed to be a native of Chile,

where a wild plant is still found which much resembles it. A similar tuber, known as the Cetewayo potato, is also eaten by the natives in some districts of South Africa. When first visited by Europeans, the aborigines in Chile and adjacent regions cultivated the potato for its edible tubers and had apparently long done so. It was probably introduced into the United States, especially into Virginia and North Carolina, toward the end of the sixteenth century. In spite of its easy cultivation, rich yield, and pleasant flavor, the potato did not receive a warm welcome when first introduced into Europe. For a long time there was a popular belief that it was poisonous, perhaps because botanically it is related to the deadly nightshade, and for years it was cultivated mainly as a garden curiosity. During the second half of the eighteenth century, however, came a series of bad harvests in some of the staple food crops throughout Europe and the potato quickly rose into almost universal prominence. Since then its use has constantly increased, for it is one of the cheapest vegetables to raise, can be kept over the winter, is easy to prepare for the table, pleasant in taste, and very rich in digestible starch. It soon became a staple food among all classes throughout central and northern Europe, so that when in the middle of the last century the black rot wrought its deadly havoc on the crops not only Ireland but large districts in continental Europe also were seriously threatened with famine. Next to the breadstuffs it is undoubtedly the most important food crop of the western nations.

In this country the main test of the cooking quality of the potato is whether or not it yields a light, crystalline mass with almost distinct,

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starch particles, or, in common parlance, its mealiness. Investigations were carried on at the Cornell Experiment Station to learn what it was that produced this mealiness, and the conclusion was reached that it depended mainly on the starch. If this was abundant and evenly distributed thruout the tuber the cells would burst open in cooking and make a light, flaky, uniform mass. If the starch was scanty in any part of the potato, water would be likely to settle there and make the cooked potato soggy. Mature but still fresh tubers hold more starch than either young or long stored ones as we have already seen, and the inner medullary layer is more likely to be poor in starch than the outer layer. Therefore the tubers most likely to cook into mealiness are the well-developed crisp ones. When the tubers are young or watery, or have a large core with many long arms branching into the outer medullary section, they are not so likely to be mealy when cooked.

This, however, does not tell the whole story. Anyone who cares for early spring potatoes knows that there is a quality between sogginess and mealiness which is very satisfactory and which is commonly described as waxiness. In many parts of Europe this condition is generally preferred and is considered a mark of excellence. While mealiness depends on starch and sogginess on water content, waxiness, according to the French authorities, Coudon and Boussard, depends on the proportion of protein to starch. If the protein is sufficiently abundant, it will as it hardens in cooking form a sort of waxy framework in which the work in which the starch will be lightly held together instead of separating into distinct flakes as in mealy potatoes, where there is not enough protein present to resist the pressure of the starch. Such waxy potatoes retain their shape better than the mealy ones and are more suitable for garnishing meats for salad making and for the preparation of many fancy dishes. As has been shown, the proportion of protein to starch is greater in young than in mature tubers, and therefore, in American potatoes at least, the early varieties are most likely to have this waxiness. In point of flavor there is almost as much difference as in consistency, as the nitrogenous tubers usually contain also a larger proportion of acids and perhaps sugars and solanin than the starchy.

#### Marks of Good Potatoes

Appearance, taste, and consistency are the points by which we judge a cooked potato. Unfortunately it is not always easy to tell from their ap-

## A GOOD YIELD OF POTATOES

The potatoes shown in the photo were raised on Prof. J. H. Shepperd's farm at Harwood, N. D. The yield was 250 bushels per acre. He gives the following in regard to the way the potatoes were raised:

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double disced in the spring and reduced to a good seed bed before the potatoes were planted.

The potatoes were harrowed at regular intervals until they were about three inches high. After that time they were cultivated at regular intervals and sprayed for blight and bugs.

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pearance which raw potatoes will prove the best, but there are certain marks which aid in making a choice.

The early varieties and young potatoes generally are preferable to more mature ones in point of flavor. Such tubers usually have a smoother skin than older ones. They are not as mealy, however, and do not keep as well. Late in the season, therefore, well developed tubers are safer. Very large ones are not especially desirable, partly because it is hard to cook them evenly and partly because they are often very variable in texture. Smooth, regularly shaped tubers with comparatively few eyes are more economical than irregular ones which can not be peeled without undue waste. In this country white or creamy-fleshed varieties are preferred, but in Europe yellow-fleshed varieties are most esteemed.

Different varieties may have distinct flavors, but the soil and climate in which they are grown and the fertilizers used cause such great variations that variety alone is no sure guide. Age is by far the most important point in determining flavor. The early varieties usually contain a larger proportion of mineral matters, acids, and protein, and therefore have a richer flavor, as has already been said. Tubers old enough to sprout begin to develop an acrid taste, due in part at least to an increased solanin content, which makes them less desirable.

Watery potatoes are always undesirable because they become soggy in cooking. Young tubers are more juicy than mature ones but their juice often holds so much more protein in solution that they cook with a pleasant waxy consistency. A good mealy potato should feel firm when pressed in the hand. If cut, it should separate crisply under the knife and be of even density thruout. If the core is large and soft, it will make a soggy mass full of holes in the center when cooked.

### Beets

Altho the greater part of the total crop of beets or beet root, as they are called in Great Britain, is used for the production of sugar or for the feeding of farm animals, yet beets are used in such large quantities as a human food that they rank as one of the most common table vegetables. White or yellow table beets are occasionally to be seen, but the red ones are the most common. The flavor is more delicate in the summer varieties than in the later maturing sorts. Each year the southern-grown beets are becoming more common in our winter market and are superseding the large fully

matured roots which were formerly so often stored as winter vegetables and which late in the season often develop a rather bitter and unpleasant flavor. It is sometimes said that beets are more nutritious than turnips, carrots, etc., but a comparison of the values for average composition does not substantiate this statement, all these vegetables being very much alike as regards the proportion of nutritive material present.

Cane sugar constitutes a considerable portion of the total carbohydrates of beets, as high as 10 per cent or more having been often reported. Some reducing sugar is also present. In beets grown for sugar making the percentage of cane sugar is considerably higher, sometimes 20 per cent or more, tho such high values are the exception. Beets are sometimes said to be very rich in cellulose, but this does not seem to be the case with American varieties whose average composition has been quoted. When beets are cooked the water becomes highly colored, and it is undoubtedly true that a considerable part of the sugar and other soluble nutrients which they contain is extracted, but how much material is removed can not be stated as no cooking experiments with beets have been found on record.

Three digestion experiments were made several years ago at Wesleyan University in which it was found that 72 per cent of the protein, 97 per cent of the carbohydrates, and 90 per cent of the total energy value of the beets were utilized by the body, figures which compare very favorably with those obtained with potatoes in tests made with the same subjects.

Beets are frequently canned at home for winter use and the commercial canned article is a very well-known product. As regards composition, the canned goods have practically the same chemical composition as freshly cooked beets.

### Carrots

Carrots are grown in many varieties, and vary greatly in color, size, flavor, and other characteristics, those most commonly raised for the table being of medium size, deep yellow color, tender, and of delicate flavor. Young carrots are much more satisfactory than old ones, as when fully matured they tend to become hard and woody,

especially at the core, while not infrequently the flavor of old carrots is disagreeably strong. Some varieties are more satisfactory than others for winter use, but the winter carrots are, generally speaking, more used for seasoning soups and other dishes than as a table vegetable. Improved methods of transportation, storage, etc., have, moreover, made the small tender southern-grown carrot comparatively common as a winter vegetable.

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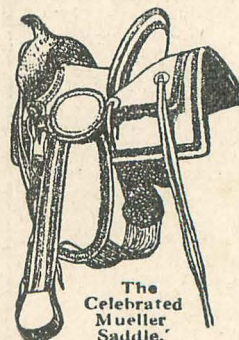
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In composition carrots do not differ very materially from other similar roots, carbohydrates constituting the principal nutritive material. Sugar is an important constituent, 12 per cent or more being sometimes present, tho perhaps 5 or 6 per cent would more nearly represent the average. Small amounts of pentosans have also been reported. The proportion of sugar in the carrot, beet, and other vegetables is very variable, being influenced by size, maturity, method of storage, and other factors. Carrots owe their color to the presence of a yellow organic compound known as "carotin," which is sometimes extracted with the juice and used for coloring butter.

### Parsnips

Parsnips belong to the same botanical order as carrots and resemble them in form and general habit of growth. The flesh of the root, however is paler, being white or light cream color, and the flavor is quite distinct and very pronounced. Parsnips may be kept in the ground over winter and are especially welcome additions to the diet in early spring, when vegetables which have been stored are losing their good qualities. For some reason boiled parsnips were long considered in some regions of Europe to be the proper vegetable to serve with salt fish, but this tradition is not followed in the United States, and they are cooked and served in a variety of ways, as are the other vegetables which they closely resemble.

### Salsify

The name "salsify" is commonly applied to three distinct vegetables, namely the common white salsify known as "oyster plant" or "vegetable oyster," black salsify, the schwarzwurzel of the Germans, and the so-called Spanish salsify. The first of these is very commonly grown in the United States, and black salsify is also grown tho less extensively, while Spanish salsify is seldom cultivated. Both common salsify and black salsify closely resemble the other succulent roots used as food in general character. They are not injured by mild frosts and may remain in the ground until late winter or early spring. As the popular name of salsify implies, the flavor suggests that of oysters.

The principal carbohydrate stored in black salsify is inulin rather than starch, and so this vegetable is often used in the diet of diabetics. The proportion of materials lost in cooking and the digestibility have not been made the subject of investigations so far as can be learned, but there is every reason to suppose that salsify

would resemble the other succulent roots in these respects.

### Radishes

The radishes most commonly grown in the United States are those with red exterior and white flesh, altho white and dark purple varieties are also well known. Tho formerly red radishes were a typical spring vegetable they are now so commonly grown under glass that they are available all winter in large markets. To be at their best, radishes should

be eaten before the roots are fully mature and should be very fresh. Besides losing their crispness they become sweeter in taste if they are kept long after they are gathered, owing to the action of a ferment or enzyme normally present which changes part of the radish starch to sugar. Similar enzymes are found in beets, carrots, etc., but in these vegetables their action is less marked.

### Turnips

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throughout temperate climates, some of which being coarse in texture are used as food for farm animals while other varieties are raised as table vegetables. There is considerable variation in the color, flavor, and composition of the turnip, the yellow-fleshed sorts as a group being commonly distinguished from the white by the name "Swedes" or "rutabagas." In the summer the early white varieties are usually preferred in spite of the fact that they are more watery, while in winter the yellow turnips are more commonly used. Solid as the turnip roots appear they contain on an average about 89 per cent of water or a trifle more than is found in whole milk. Only about 20 per cent of the total protein present is in the form of albumin.

#### Onions, Garlic, Etc.

The various members of the onion family are so commonly used for flavoring purposes that they should perhaps be included with the flavoring vegetables. Such classifications as those followed in this bulletin are, however, of course, purely arbitrary, and in the case of the onion family some varieties are so largely used as vegetables that it has seemed best to discuss them in connection with the roots, tubers, etc., as they are used in practically the same way in the diet. All the members of the onion family are characterized by very strong flavor and odor, due to the presence of allyl sulphide, a characteristic oil-like organic compound of sulphur. Different varieties of the plant vary somewhat in flavor and composition, and the flavor is usually more abundant in the bulbs than in the leaves or other parts. The flavor-yielding material is very volatile and is broken down by heat to some extent, and consequently the cooked vegetable has a much milder flavor than the raw.

The common onion in its many varieties is the best known and most used in the United States of the onion family. The total crop produced is very large, and quantities are also imported from southern Europe, Bermuda, and the West Indies. As with most vegetables, the young and somewhat immature onions are preferred to the fully matured bulbs, tho the latter have the best keeping qualities.


White varieties are milder in flavor than the red or yellow sorts and are generally preferred as table vegetables. If they are to be kept thru the winter, onions should be taken from the ground as soon as the stalks begin to wither and cured or dried in the air for about ten days. If moist when stored they will not keep well.

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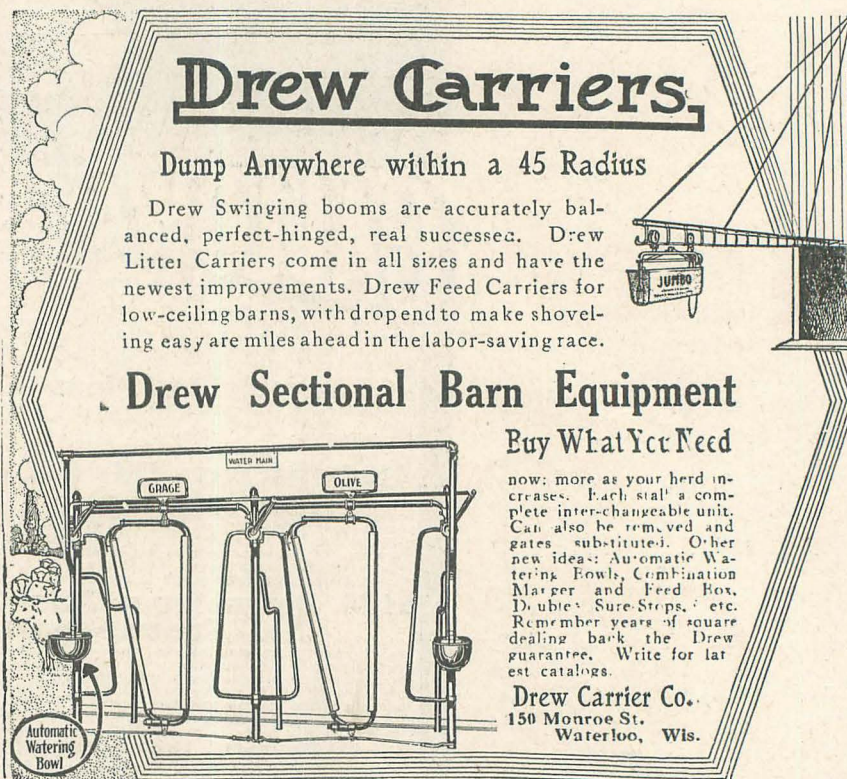
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## PREVENTION OF HOG CHOLERA

The prevention of hog cholera centers around the fact that it is a germ disease. The only way that a hog can become infected with hog cholera is that some of the germs be introduced into its system. This means that the starting point in prevention is to carefully isolate infected animals and the premises on which they are kept. Hogs that die from the disease should either be burned or deeply buried. When the attack is over the pens should be thoroly disinfected. All bedding should be burned.

The next step in prevention is to keep the germs from passing from the affected herd to the healthy one. It is pretty well established that the germs are not carried thru the air, but must be carried by something. The something may be a person's clothing or shoes, or animals, as dogs, chickens, pigeons or sparrows.

When hog cholera occurs on nearby farms, it is advisable to keep the hogs indoors where possible, and everybody except the one caring for the hogs barred from the hog lot and hog house.

The feed in itself plays little or no part in the production of the disease, but it may have become contaminated with the germs. Offal from hotels and restaurants and even from the family kitchen may contain hog cholera germs in the trimmings from pork products; such food should be thoroly cooked.

New hogs introduced into a herd sometimes bring hog cholera. The infection may be either from the home herd, or they have may been infected in transit.

When hog cholera breaks out in a herd, the sick hogs should be killed and burned at once; if allowed to linger around, they saturate the yard with the germs, and in some cases, they hide themselves in out of the way places, and die there.

The treatment with serum gives a hog that has not been exposed to hog cholera, an immunity for four weeks only; while if the hog is exposed to infection at the time of the treatment, the immunity may be for several months, or for a life.

The North Dakota Veterinary Department gives the following suggestions in regard to the use of serum:

"Remembering that non-exposed hogs injected with serum are immune only for four weeks, it becomes clear that they would have to be injected again at the end of that period, if their immunity against the disease is

to be continued. With the high cost of and scarcity of serum, this would not be profitable, and hence, it is always better to wait with the serum—no injection until the disease actually occurs in the herd, or until the exposure to infection becomes imminent or inevitable. In the case of hogs about ready for market or in that of animals to be exhibited at fairs would the use of serum only be warranted.

"In districts where cholera is not prevalent, serum should not be used. In infected districts and on farms in danger of becoming the seat of an outbreak, hog owners should attempt to secure a supply of serum. Keep the same in the ice-box until its use becomes advisable. This would certainly be when the first hog shows evidence of the disease, and after that there should not be any delay in the use of the serum. When disease does not make its appearance, there would be no serum wasted and some one also could perhaps be benefited by its use."

"In order to prevent the spread of hog cholera by the use of virus, the North Dakota State Livestock Sanitary Board has prohibited the use of virus for the simultaneous treatment in the field."

## MUCKRAKING AND MUCKRACKERS

(From the Advance, Beach, N. D.)

What a confusion of ideas there is in our modern use of the word "muckraking!" It has been so wrested from its original meaning that John Bunyan himself would fail to recognize it. In the great allegory the sordid pilgrim gave his

whole attention to the straws and rubbish and ignored the angel above his head. But, today when a brave man lays bare the corruption of a town or city, it is called "muckraking," and is often frowned upon by the easy going burghers, when it is really ethical and social sanitation.

Often the investigator brings to our attention unpleasant facts; but if they are facts we ought to be grateful to him. Any man who warns us when our home is afire, or informs us about an overlooked disease-breeding refuse near our home—that man deserves our thanks. Why villify the person who is seeking to prevent the spread of disease, physical and social? "Muckraking," forsooth! Our protest should not be made against the "raking" but the "muck." And "muck," or abuse, or inefficiency must first be pointed out before the cleansing can take place.

Just so long as there is "muck" let it be raked out into view and condemned and removed. Let the reformer rake all the more thoroly and bravely, because he lifts his eyes now and then and sees above his head the angel of a municipal ideal.

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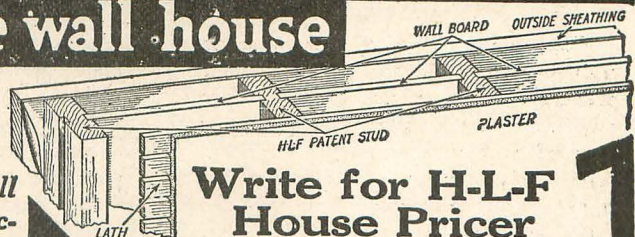
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Lisbon office.

**Vol. 16 NOVEMBER, 1914 No. 5**

We welcome the large number new subscribers. We are at your service.

Plan to attend the Tri-State. Send in your exhibit early. All exhibits, except potatoes, will be judged before the opening of the convention.

In climate and soil, as in many other things, the country's greatest blessings are too often, for want of real knowledge, considered serious impediments.

The Agricultural department of the Nebraska University furnishes free buttermilk to its agricultural students to remind them of the farm they left and to which they are preparing to return. Good idea.

Only by keeping accurate records can the profitless dairy cow be discovered and weeded out. "Star Boarders" in a dairy herd are a good deal like drones in the hive; only drones are not wholly useless, the most of the former are.

There will be a greater demand than ever for Macaroni wheat. The present war is teaching America to rely upon itself. We can make just as good macaroni here as they do in Italy. We have the right kind of wheat. Use macaroni wheat flour, ask for *macaroni made in America*.

The business of breeding horses should receive a tremendous impetus on account of the demand made for them as the result of the European war. The war should be over, however, long before the number of horses can be materially increased, yet the price for a good animal will remain

high for a long time after the close of the war.

Young people are bound to go, whether to city or country, where they can find the best market for their brains. Unfortunately for the country and also for a large number of young people the education in common use fits city business rather than rural business. This, however, is being corrected and in due time public education will prepare men and women for life—for the life they will have to live whether in city or country.

Have you contributed to the Belgium relief fund? There is not a person in this state, no matter from what country, whose heart does not go out to the starving people of that country. Would it not be well to institute a movement toward bringing to this state some of those Belgians who have been deprived of a home? There are few better farmers in the world. They might teach us by their example more than we would learn in decades from books.

There should be an active wide-awake Grange in every locality in the state. The Grange is a farmers' organization and has accomplished many splendid reforms, the politicians promptly claimed the credit for some of its most important work. If farmers ever expect to exert any influence as an industrial body of workers, they must learn to work together in perfect harmony, just as other classes of workers do. As it is, farmers exert no influence whatever when it comes to shaping the legislation of the state or nation. Some things are done for them, such as making provision for better roads, etc., but not as a farmers' movement. It is done for them and often in spite of them.

As soon as the "rural credit" and "farm mortgage" advocates get beyond the talking stage, may we look for something substantial to be developed. But when shall we get beyond the talking stage? As a rule when a really good idea is advanced, especially if it should be in favor of lower interest rates or co-operation in marketing, the fellows interested in maintaining the status quo immediately take the lead and adroitly, while apparently favoring the movement, either lead it out into the jungle where it starves or they talk it to death. In either case farmers are inclined to be satisfied, believing all that could be done was accomplished in their behalf—but in vain.

The present war, which involves practically all of Europe and a portion of the Orient, is the strongest argument the world has yet produced against human leadership based on personal ambition. Think of it. Ten million men are doing their best to kill each other, with the best implements ever invented for that purpose. And why? Because three or four rulers are playing for high stakes in matters of commerce and government. The men doing the killing are not angry with each other; in fact they have no acquaintance with each other, but they suffer and many of them die because they are made to feel that it is their duty to do so. Millions of brave men will perish; as many widows and orphans will be made and billions of property destroyed—thus half a century will be devoted to rebuilding what was burned and wasted. Moreover, the common people will bear the brunt of all the suffering and all the repairing. "What fools these mortals be!" Eh?

Next month the Boys' and Girls' Institute will be held at the Agricultural College. The influence of the industrial contests held thruout the state the past five or six years can not be estimated. Into thousands of homes there has entered an enthusiasm for more scientific farming by way of the boy or girl to whom these contests have given inspiration. Would that every board of county commissioners might realize the advantage to their county of a band of young people returning from the Institute chock full of the latest ideas in corn raising, poultry culture, dairying, domestic science, diversified farming, etc. The same board who grudgingly dole out a few dollars for the traveling expenses for these young boosters for better farming in the county, thus making the county attractive to the prospective settler, will often appropriate hundreds of dollars for a bridge to gratify the wishes of some influential citizen. Give the boys and girls a chance. They have made good and they will continue to do so.

## PUBLISHER'S SHOP-TALK

We are publishing the North Dakota Farmer in the interests of better farming and better farm homes. Not in five years have we received so many new subscriptions. By the way, are you among those who are boosting? You certainly have much to be thankful for. You know how to show it.

**SEE OUR SPECIAL  
OFFER, PAGE 2**



## Pure Food Advertisers

The products advertised below are in compliance with the pure food law of North Dakota and of the highest grade.  
ASK YOUR GROCER FOR THEM.



**"Just Splendid!"**

Our mothers know. They look for something more than pretty labels and cheap prices. Quality counts with discerning buyers. Hence the success of

**NOKOMIS**  
Canned Goods

All varieties of delicious canned fruits and pure, wholesome vegetables—from the choicest orchards and gardens—are to be had in this well-known brand.

The successful merchant gets a good thing—and then PUSHES it.



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**Our Candies  
Are Pure**

**Chaney-Everhart Co.**  
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**ST. PAUL, MINN.**

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JELLY  
DESSERT**  
NUTRITIOUS-WHOLESOME

One package, 10 cents, makes one pint of wholesome Fruit Jelly. As flavors from true fruits.

**MONARCH BRAND**



FOOD PRODUCTS

A GUARANTY OF PURITY. A WELCOME GUEST at every table where the HOUSEWIFE demands the BEST. THE MONARCH LABEL insures QUALITY in Coffee, Catsup, Pickles, Maple Syrup, Canned Goods or any article bearing the MONARCH BRAND of REID MURDOCH & CO CHICAGO.

**Eat North Dakota Sweet Corn**

**Sanitary**

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ONLY  
FACTORY OF  
ITS KIND IN  
THE STATE.  
SEALED IN  
SANITARY  
CANS AT  
OUR  
MODERN  
THREE-  
STORY  
FACTORY



**Delicious**

NORTH  
DAKOTA  
CORN  
EXCELS IN  
SWEETNESS.  
ASK YOUR  
GROCER  
FOR OUR  
BRAND.  
WRITE FOR  
PARTICU-  
LARS

**Shenoyenne Valley Canning Co.**

**Lisbon, N. D.**



# Livestock Department

## FARM AND STOCK NOTES

[N. J. Shepherd

A good feeder is a regular feeder.

An easily fattened cow is usually a poor milker.

When the cows have been long in milk the churning becomes more difficult.

A stunted heifer will never make a breeder of thrifty, quick maturing stock.

Nothing will atone for poor processes and lack of care in butter making.

A large udder does not always indicate the amount of milk a cow will yield.

Chicks on a free range do not require as much food as those closely confined.

A cow that is a good milker can generally be depended upon to bring good calves.

Colds lead to roup and colds are brought on by exposure to dampness and droughts.

Usually the hens which are late in commencing to molt take the longest time to get over it.

Having movable separate nest boxes makes it easier to clean them up in fighting lice and other vermin.

A medium-sized male with large hens will give an earlier maturing, better-shaped bird than an overgrown male with small hens.

There are few things on the farm that will give as steady an income, as the making and selling of good butter.

Never buy a brood sow with short legs and short chunky body. She must have big feeding capacity in order to produce plenty of milk.

Inbreeding is the breeding together of birds that are akin. Linebreeding is the maintenance of certain blood lines; it may or may not be inbreeding.

The better the animal the larger the profits, and as a rule the animals that are bred for special purposes are more certain of giving good results.

Oil meal is laxative and helps to prevent the feverish condition which so often appears at farrowing time and which is occasionally responsible for pig eating.

A male bird is not necessary for the production of eggs, but is useful only to fertilize the eggs which will be laid in spite of their absence or presence.

A persistent milker is made very largely by her treatment the first season. If carelessly handled and allowed to go dry prematurely she will form a habit that will never be broken.

Sheep are different from cattle or hogs, for at the same time they are putting on fat they are growing a fleece of wool that will pay for their feed.

It is the man with the faculty of keeping his teams and implements in good working order and steadily on the move who accomplishes the big seasons work.

True science in dairying is that which enables us to feed economically and in such a way as will give the largest product from a given amount of raw material.

In order to judge whether an animal is profitable or not it is necessary to know the amount of milk she gives and the percentage of fat it contains.

Lambs, wool, mutton and manure are the four cardinal points of sheep raising. Profit is not in the total amount derived but the excess after the cost is deducted.

Every week that a pig is not growing, the feed is worse than wasted, because it takes feed and time to overcome the unthrifty habit and all feed is lost until growth is resumed.

Any good brood sow will lose flesh while suckling a good-sized litter of pigs, and if in good flesh at farrowing time she has some reserve to draw on for the benefit of her pigs.

Success in raising chicks more than in anything else depends upon doing the right thing at the right time and the right time is in a series of little things that have to do with care and feed.

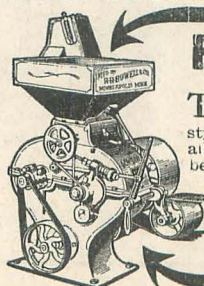
The good milker must have a natural disposition to convert her food into milk and then her rations must be a milk producing one—not one for growth nor to fatten, but one which will make her produce rich milk.

## MANAGEMENT OF THE DAIRY HERD

Henry C. Alford, in U. S. Bulletin  
DECEMBER—EIGHTH YEAR  
The Stabling Season

Change from pasture to stable.—Up to a certain point fall pasturage is as good as in any other part of the year. But after one or two hard frosts it is well to offer the cows some nice hay when they come in at night, and if they eat it with relish, one may be pretty certain the season has arrived to gradually change the herd from pasture to stable for the winter. The cows should not be left out at night after it becomes chilly, or be exposed to cold autumn storms. They may be allowed in the field a few hours on all pleasant days until snow flies, but without expecting them to get much besides water and exercise. Before keeping them steadily at the stable and yards the feeding should be, by gradual steps, completely changed to the full stable diet.

Preparation of the stable.—Meanwhile, or on leisure days earlier in the year, the cow house should be prepared for its occupancy by the herd thruout the stabling season. Boxes, stalls, and feeding troughs or floor should be thoroly cleaned and disinfected, so that no animal can discover or be subjected to any unpleasant traces of another and previous occupant of the place. Then assign every cow her particular place for the winter, and gently insist upon every one being always in the right place. The bedding, absorbents, and disinfectants should be provided in abundance and in ample time for all to be quite dry. Use no damp material under a cow, no rotten straw, and no moist earth or sawdust. In order of efficiency, the best absorbents are peat, spent tanbark, sawdust, wheat straw, forest leaves, and dry earth. If earth alone is used, from 30 to 40 pounds per cow will be needed daily—a big shovelful. If straw alone, provide 9 or 10 pounds a day, and less if cut short. A good combination is 5 or 6 pounds of straw and 10 or 12 of earth or sawdust. An excess of bedding or litter is undesirable. If the floor on which the cow lies is dry and not cold, very



## ROLLER FEED MILLS

GRIND A WAGON LOAD OF FEED FOR 10 CENTS.

THIS is the Famous Howell Roller Mill you have heard so much talk about. The new improved mill for the scientific grinding of grain. Old style Burr and Stone Mills are out of date. Thousands of them are being annually replaced by the Famous Howell Roller Mills. Grinds twice as fast as the best burr mill made. Does not heat the feed. Grinds Graham and Rye flour as well as feed. Has big capacity. Requires little power. No burrs or stones wear out. Guaranteed to last a life time. Made in 13 sizes suitable for any size engine. Save one half your time, gasoline and money by using a Howell Roller Mill. Write for catalog D.

R. R. HOWELL & CO., Mfrs., Minneapolis, Minn.



little litter is needed for true bedding. Its chief use is as an absorbent, and if more than necessary for this object is used, the manure becomes too dry and bulky, and is lessened in value per load. Land plaster is a very satisfactory disinfectant or deodorizer about a cow house. If one takes good care of the manure and intends to add chemical fertilizer, the latter may be used in the stable in some forms, instead of plaster. A refuse of the "double phosphate" works is an article called phospho-plaster. This can often be got at about the same price as common plaster, and as it contains about 1 per cent of phosphoric acid, it is a good addition to the stable manure, while also an efficient disinfectant. Kainit, about the lowest grade of German potash salt, is a good substitute for plaster in the stable. It costs half as much again, sometimes twice as much, but less of it may be used, and the potash it contains (11 to 13 per cent) is a very desirable addition to the manure in several ways. From 1 to 2 pounds of kainit or plaster per day to each cow can be profitably used, scattered in the litter and along the gutters of the cow-house thruout the stabling season.

Watering—It is a mistake to be satisfied with watering the herd but once a day. If they can be induced to drink twice or three times a day, it should be done. Cows need much water. It has been found that the average milch cow requires about 81 pounds of water a day while in milk (nearly 10 gallon), and about 53 pounds while dry. Of this, the cow in milk takes rather more than two-thirds (say 7 gallons) as drink, and the rest in her food, while the dry cow takes rather less than two-thirds

as drink, and a little more than one-third in the food.

### Feeding the Herd

Uniformity in feeding.—The first advice is not to feed the herd as a herd. Cows differ in their tastes and and in their requirements in the way of food just as human beings do, although, perhaps, not to the same extent. To feed all the cows in a herd alike, day after day and month after month, as is so often done, is an absurd and wasteful practice. Some are sure not to get enough for greatest profit, and others are likely to get more than they will use to advantage. This as to quantity only; but differences in kind of feed may be equally desirable. In a thoro study and comprehension of the question of feeding lies the greatest opportunity for the exercise of real economy in the management of the dairy herd.

Rational feeding.—Scientific feeding means simply rational feeding, a common-sense application of a good understanding of the objects of feeding, the character of food materials, their proper relations, combinations and effects, and the needs and characteristics of the animals in hand. The principles of scientific feeding, the composition and digestibility of feeding stuffs, the food requirements of animals for various purposes, and the calculation of rations, have been explained in Farmers' Bulletin, No. 22, issued by the Department of Agriculture. The composition of a large variety of feeding stuffs grown and employed in this country is given in the appendix to the Department Yearbook, 1896. To these, therefore, the student of the great feeding problem is referred, as that is much too big a subject to discuss in detail here.

### General Notes

There are various other questions which arise in the consideration of the problem of feeding the dairy herd which have not been touched upon, and but a part of which can even be mentioned here. On the practical side, one should ascertain the kind and quantity of feeding stuffs which have been produced and are available on the farm, the best way of preparing these for the cattle, and the matter of markets in its relation to getting those articles which it seems desirable to buy in order to supplement the home supplies and balance the rations. On the scientific side, there are a good many additional points which deserve careful attention, such as the relations of breed and feed in the economy of dairy practice; the effects of different foods upon the production of milk and butter, in quantity and in quality, having the

item of flavor prominent; effects of food upon the economy of churning or "the churnability" of the cream; and the comparatively new subject of bacteriology in its bearings on dairying, the health and cleanliness of the cow-house, and the preservation of products.

The whole subject of animal nutrition is under investigation and discussion, and by watching the publications of American experiment stations and the reviews of foreign work new suggestions of practical application will be found appearing at intervals.

The manure from a well-fed herd is a matter of great consequence, and its proper management requires judgment. The better the feeding the better the manure. While all manure is worth good care, the better the manure the more important it is to handle it well to prevent heavy losses. The best single piece of advice as to handling stable manure is to get it from the stable to the land where wanted without delay and there spread it with the least possible expenditure of labor. Yet this general plan must be modified at times, and according to circumstances.

### FEEDING THE DAIRY COW


Charles Cristadoro

How much, and what kind of food, and the balance of protein to carbohydrates depends on conditions; the weight of the cow and what she may be producing as to milk. Observation and applied brains are factors in dairying. Any man with a shed and "some cows" can become a boarder of cows, run a cow's boarding-house, or be a champion "manure producer," but to really know what you are doing and make the dairy pay is advanced dairying indeed.

All kinds of general rules are laid down as to a balanced ration; for instance, for every three pounds of milk yielded by the cow one pound of grain should be included in the ration, with 40 to 50 pounds of corn silage and clover or alfalfa, what the cow will eat up clean.

"Cows having a balanced ration were able to consume 12.12 per cent more nutriment and to make 33.7 per cent better use of the nutriment consumed. Six and one-half cows on a one to six ration have produced as much as nine cows on a one to eleven ration. Excess of carbohydrates does not make up for lack of protein."

The average cost of a heifer two years old, as the government figures



**Two  
O.I.C.  
Hogs  
Weigh 2806 lbs.**

Why lose profits breeding and feeding scrub hogs? Two of our O. I. C. Hogs weighed 2361 lbs. Will ship you sample pair of these famous hogs on time and give agency to first applicant. We are originators, most extensive breeders and shippers of thoroughbred hogs in the world.

**U. S. Govt. Inspected Herd**

We have bred the O. I. C. Hogs for 51 years and have never lost a hog with cholera or any other contagious disease.

**Write—Today—for Free Book  
"The Hog from Birth to Sale"**

**THE L. B. SILVER CO.**  
544 Vickers Building, Cleveland, Ohio



## CLASSIFIED ADS.

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Small advertisements will be classified under appropriate headings at the low price of one cent a word for each insertion. Cash must accompany all orders. Each initial or number must count as one word. TRY IT HERE.

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POLAND CHINA PIGS, also Shropshire sheep. Seed grain. GEO. N. SMITH, Amana, N. D.

ASH GROVE FARM. Knudtson & Son, Props. Breeders of Pure Bred Percheron Horses and Short Horn Cattle, Both Sexes. Stock for Sale. Route 1. Fullerton N. D.

J. S. BIXBY  
RED POLL CATTLE. If you want dual-purpose cattle, I have the best. Rhode Island Reds, also in stock. LISBON NORTH DAKOTA

Mulefoot Hogs are Healthy, Hardy and Prolific. Jno. Dunlap, Breeder, Williamsport, Ohio.

### SHORT HORNS

Young stock for sale. All registered. Jim Uglum, - - - - - Bowbells, N. D.

Maple Lodge Large Registered Yorkshire Pigs, \$9 to \$12. Sired by Egeland Valliant weight 600 pounds.  
Bourbon Red Turkeys, ..... \$1.75 to \$3.  
Partridge Wyandottes, Eggs and Stock, ..... \$1.50  
Good Winter Layers. All Stock Guaranteed  
EDWARD KLEBAUM, - - - - - Egeland, N. D.

REGISTERED POLLED SHORTHORN CATTLE AND BOURBON RED TURKEYS.  
Some good young bulls for sale.  
Odessa Stock Farm, - Devils Lake, N. D.

Meadowlawn Farm. The largest breeders in North Dakota. Percheron Horses, Shorthorn Cattle, and Berkshire Hogs. Where quality counts. Address: A. H. WHITE, - - - - - Kramer, N. D.

For Large Yorkshires of either sex and bred gilts, address L. A. Knoke, Badger Den Stock Farm, Willow City, N. D.

Choice Poland China Hogs always on hand. Bred Gilts all sold. Register now for spring pigs, either sex, prices right. Thos. Forbes, Petersburg, N. D.

HIGH GRADE LIVESTOCK: Clydesdales, Double-standard Polled Durhams. Farm Horses and Drivers. Leal Stock Farm, - - - - - Leal, N. D.

### PERCHERONS FOR SALE

We are offering a choice lot of young mares and stallions, all raised here on the farm and thoroughly acclimated.

WHITE BROTHERS  
Valley City - - - - - North Dakota

### ENVILLA STOCK FARM

Envilla Stock Farm, Cogswell, N. D. will quote you special prices on Angus Cattle, Shetland Ponies, Duroc Jersey Hogs, Wolf Hounds, Collies, Rat Dogs and other breeds, Angora Cats. All varieties of chickens: turkeys, geese, ducks, guineas, pheasants, rabbits, ferrets. Pets. Live Foxes, Skunks, Mink and Badgers

### MISCELLANEOUS

WANTED. Live Foxes, Skunks, Mink and Badgers, any time.  
Envilla Stock Farm, - - - - - Cogswell, N. D.

WANTED to hear from owner of good farm for sale. Send cash price and description.  
D. F. Bush, Minneapolis, Minn.

Lady Agents, to represent us, placing our fine collection of Perennial Flowering Plants in every City and Town, for fall planting. Address Wm. Plaender, Jr. Proprietor Pioneer Nursery, New Ulm, Minn.

FOR SALE: 45 Horse, 4 Cylinder, Eagle Traction Engine; nearly new for \$800.00.  
F. Jaskowiak, - - - - - Bismarck, N. D.

FILMS DEVELOPED, 10 cents (any size). Prints or Post Cards, 3 cents each. Ansco films at list price, sent post paid. One of the largest finishers in this country. Thirty years' experience.  
RITCHIE BROTHERS

Dept. 2, - - - - - Centralia, Ill.

GIVE GERMAN DISTEMPER REMEDY a Trial. Your money back if not satisfied.  
German Distemper Remedy Co., Goshen, Ind.

it, is \$61.42; made up of initial value \$7.04; feed, \$40.83; labor, \$7.81; other costs, \$13.73, and a credit of \$8.00 for manure. The cost of the food is one-half to two-thirds of the dairy game, and therefore the necessity for the proper amounts and the right kind of food. How evident, therefore, is it that a dairyman should know what his cow is eating, and the cost of same, and what she is yielding in milk, and the returns from same! So it may be assumed that at two years of age a heifer raised that will not call for \$60 is a loss on the first cost, not making full returns for her feed.

Prof. Washburn figured the cost of keeping a cow in Minnesota, made up from three years' data, was \$58 per annum and even on the basis of farm grown food it cost \$21.50 with another \$3.00 for cash feeds. And this cost of feeding, with other expenses coupled with the average cow giving 4000 pounds of milk, 3.8 per cent butter fat, hardly repays the dairyman any profit for her keep. So a 4000 pound cow, "average cow," is not only a fair feeder but almost a star boarder, and she doesn't begin to really and appreciably pay her way for the food she eats, under a yield of six, eight or ten thousand pounds of milk per year. So it is first to secure the producing cow and then feed her so she continues to produce.

It was shown in Wisconsin that the average cow, elevated from a 175 pound butter fat cow to a 275 pound butter fat cow, meant a difference of \$50,000,000 annually to the state. Worth while, indeed, to buy or raise the right kind of a cow and learn to feed her right.

Protein cuts an important figure in the ration of a dairy cow and the question arises as to the cheapest source. Every 28 pounds of milk contains one pound of protein, but to get that the cow must eat two pounds of protein. Corn meal at \$1.50 per 100 pounds is expensive; wheat bran at \$1.25 per 100 pounds is expensive also when compared with cotton-seed meal at \$1.65 per 100 pounds (these are eastern cost figures) which contains five times as much protein as corn meal. Cotton-seed meal is the cheapest source of protein. Clover and alfalfa hay make the best roughage and early cut hay contains more protein than late cut hay. A hundred pounds of timothy hay contains but 2.8 pounds of protein, while 100 pounds of clover contains 6.8 pounds protein.

Dairymen using their own feed because it is raised on the farm,

think it economy to feed it to the stock, forgetting that it is not so much what goes into the stomach of the cow that counts as what the cow digests and turns into milk. And so they feed from the farm when if they sold some and bought milk-producing feeds the results would prove far more economical. But in the absence of knowledge many things happen that should not occur. A dairy farmer outside of Chicago puts it this way:

"You would not wonder at the poor financial results obtained here if you knew how unfit a big proportion of our tenant farmers are to handle cows profitable. It is useless to tell them to read more and brighten up their minds. They never have read and it is too late now for them to begin. The consumers in Chicago would pay a fair price mighty soon for their milk, if it was not for the production of this milk of ignorance. That is what keeps the market down and keeps the rest of us under the harrow."

The curse of any business, ignorant competition.

What's the moral of it all? Mix brains with your milk, figuratively speaking, and a very large proportion of brains can be acquired, free for the asking, by sending to the U. S. Department of Agriculture at Washington and procuring the latest data on the dairy action. Read the bulletins when they come; don't throw them on the tool-shelf, but read them and apply the knowledge secured. Knowledge is power for profit—even on a dairy farm.

### PIG MANAGEMENT

Geo. M. Rommell, in U. S. Bulletin No. 205

DECEMBER - - EIGHT YEAR

Any locality that will grow clover of any species, or that is favorable to the production of alfalfa, peas, or beans, or where grains are readily grown—not only corn, but barley, wheat, oats, or rye—will be a favorable situation for the successful production of pork. If it is also a locality where dairying is common, no better advantages are required; for, given leguminous pasture—clover, alfalfa, peas, beans, etc.—as a basis, with a grain feed that can be readily grown, and also dairy by-products, the very highest grade of pork can be produced at a minimum cost. Variety of feed alone is an item of immense importance in feeding. An animal tires of a constant ration of one kind, and is more easily put "off feed" at such times than when he is



occasionally supplied with a change to keep his appetite keen. Not only has variety of feed an influence on appetite, but it results in a better quality of pork.

The house and its location.—Hogs are easily affected by extremes of heat and cold, and the character of their shelter will therefore depend on the locality. If the locality is one of severe winters, warm quarters are a necessity. In erecting a piggery in northern latitudes four things should be especially considered—(1) light, (2) ventilation, (3) warmth, and (4) cleanliness. Under cleanliness, ease of cleaning and dryness must be regarded. A well-drained location should be chosen; one that will give the hogs a good climb to reach it will provide needed exercise. Under any circumstances the house should be well constructed and warm. If boarded up inside with good matched siding, such a house will be comfortable in zero weather, and sows may farrow there with safety. Concrete or brick floors are expensive, but if the initial expense can be incurred and the floors are well laid they will pay good interest in the saving of manure and the dryness of the house. Animals should

not be compelled to sleep directly on such floors, for rheumatism and colds are very likely to result. The best floor for a sleeping or farrowing pen is one of wood on concrete, the wood being 2 by 4 inch timbers, laid from one-fourth to three-eighths inch apart to allow drainage. If not constructed in this way concrete and brick floors should be kept well littered. A clay or ordinary earth floor is excellent and by some preferred to any other. It is the warmest floor, but not so easily kept clean as one of brick or concrete. If a house is constructed with earth floors care must be taken that the floors are well drained, both underground and on the surface.

#### Fencing

No man should attempt to raise hogs without adequate fencing of yards and pastures. An animal of any kind, but especially a hog, can make himself an intolerable nuisance if not confined within proper bounds. For pastures woven wire is the best fencing material, all things considered. Such a fence may be purchased ready-made or may be made on the farm by

machines, of which there are several good kinds on the market. From motives of economy it may be desirable to run a fence of woven wire around a field to a height of 30 to 36 inches, and above this to stretch two or three strands of ordinary barb wire. This will make a hog-tight fence, and if horses are necessarily placed in the field the fence will be much safer than the ordinary one made entirely of barb wire. Midway between the posts the lower strand in the fence should be securely stapled to a small post or stake; this will prevent hogs from working their way under the fence.

The details of selection, feed, and management of livestock are intricately interwoven and interdependent. A man may be an excellent judge of stock, able to select those animals for his herd whose use will give the best results in breeding; but if his system of feeding and management is not such that the animals will thrive and yield a good increase, good selection is rendered ineffective. On the other hand, the herd may be carefully fed

WANTED—Responsible party to take charge of business in each county. New Automatic Combination Tool, combined wire fence stretcher, post puller, lifting jack, etc. Lifts or pulls 3 tons, weighs 24 pounds. Sells to farmers, shops, teamsters, etc. Descriptive catalogue and terms upon request. Harrah Manufacturing Co., Box M., Bloomfield, Ind.

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### ST. PAUL UNION STOCKYARDS COMPANY, SOUTH ST. PAUL, MINN.

#### Comparison of Receipts and Shipments of Livestock for October, 1914

Railroads	Receipts					
	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
C. R. I. & P.	519	200	921	154	.....	36
C. G. W.....	1014	365	4470	824	2	114
C.M.& St.P.	5941	774	13424	20119	64	550
M.&St. L.	2130	405	9134	782	5	219
C.,St.P.,M.& O.	5101	848	15985	4529	41	456
C. B. & Q....	466	51	1909	1171	1	57
M.St.P.&S.S.M.	16068	2110	22610	5475	14	956
Gt. Nor. ....	29010	3675	32024	105782	24	2071
Nor. Pac.....	19140	1551	12012	37626	6	1024
St.P.B.& T....	.....	.....	.....	.....	.....	.....
Driven In.....	584	163	1001	111	31	.....
Total.....	79973	10142	113490	176573	188	5483
Inc. over 1913	7819	.....	.....	.....	.....	.....
Decrease.....	.....	597	18080	43292	368	191
Jan.1 to date.	375203	103122	1127998	565552	4086	34425
Inc. over 1913	39286	1221	178467	34735	.....	4123
Decrease.....	.....	.....	.....	.....	659	.....
Average Wts.	818	201	215	77	.....	.....
Railroads	Shipments					
	Cattle	Calves	Hogs	Sheep	Horses	Total Cars
C. R. I. & P.	3658	2	.....	1975	.....	129
C. G. W.....	3824	200	294	11397	5	188
C. M. & St. P.	18428	284	17527	20742	22	904
M. & St. L.	2140	32	235	1574	.....	79
C.,St.P.,M.& O.	5288	268	3871	8439	2	246
C. B. Q.....	12829	121	9173	71720	25	910
M.St.P.&S.S.M.	1935	164	441	10537	67	116
Gt. Nor.....	3964	379	393	4941	34	154
Nor. Pac.....	5461	667	.....	2430	3	161
St. P. B. & T..	34	6	.....	.....	.....	1
Driven Out...	948	273	1903	177	46	.....
Total.....	58509	2396	33837	133932	204	2888
Inc. over 1913	1211	731	.....	55802	.....	.....
Jan. 1 to date	254381	22164	315634	421938	4042	13812
Inc. over 1913	12368	1118	93860	16036	.....	1828
Decrease.....	.....	.....	.....	.....	662	.....



and skillfully managed, the feed may be the best and properly combined, the shelter warm and dry, and the water supply pure; but if the herd is poorly selected the owner is practically throwing away the feed he gives them.

#### Sanitation in the Hog Lot

The greatest drawback to the hog industry which breeders in this country have to contend against is found in the losses which may be experienced thru outbreaks of hog cholera or swine plague, thru the contraction of tuberculosis, or thru the infestation of the animals, especially young pigs, by parasites. Were it not for the fecundity of these animals their profitable production in the presence of these serious diseases would be out of the question.

In the following remarks on sanitation no attempt is made to go into the details of the diseases affecting hogs or their treatment. The object is merely to call attention to the simple measures which may be used by any farmer to avoid, to a large extent, the decimation of his herd by epidemics. Cleanliness and rational methods of management are relied

upon by thousands of farmers to keep their herds in health and vigor. They are the marks of the good farmer and successful hog breeder.

There are a few fundamental facts which the breeder must remember if he is to avoid losses by reason of the presence of hog cholera or swine plague in the herd. The first is that they are specific germs diseases disseminated by bacteria, and the contagion can not be spread from one animal to another or from one herd to another except thru the agency of these minute organisms. They may be carried in a multitude of ways—by the hogs themselves, on the clothing of persons, on vehicles, in feed, by birds, dogs, or other animals, or by streams. The breeding or feed of a hog can not cause either disease, altho bad methods may so weaken the constitution and vitality that the animal becomes more susceptible to them than would otherwise be the case. Since these diseases can only arise from the presence of their specific causative agents, it can readily be seen that dentition and the presence of supernumerary teeth or black tusks

can not, as has been suggested by many, play any part in their development. A second fact to be borne in mind is that diseases caused by bacteria may be best prevented or controlled by thoro disinfection and scrupulous cleanliness.

#### Prevention of Disease

In dealing with the diseases of hogs, preventive measures must be most relied upon. The animals must be given dry and well-ventilated quarters, which must be kept clean. Contrary to common belief, hogs have some habits which raise them above other domestic animals from the standpoint of cleanliness. For example, unless compelled to do so, a hog will not sleep in its own filth. If part of the floor of the pen is raised and kept well bedded with straw, while the rest is not, all excrement will be left on the unbedded portion of the floor, and the bed itself will be always clean.

In addition to cleanliness, close attention should be given to the feed which is supplied, that nothing may be fed which will convey the germs of disease, especially tuberculosis, to the herd. If the hogs are fed milk in any form obtained from cows kept upon the same farm, the cows should be subjected to the tuberculin test, as by this means all tuberculous milk may be kept from the hogs. If they run with the cattle of the farm a tuberculin test of all the cattle is none the less desirable. Animals dead from any disease should not be fed to the hogs until the meat has been made safe by cooking. Skim milk or refuse from a public creamery should not be fed to hogs until it has been thoroly sterilized.

Feeding and drinking places should be clean and the water supply pure. Unless the origin is known to be uncontaminated and there has been no possibility of infection during its course, hogs should not be allowed access to any stream. Wallows should be drained out or kept filled up as much as possible. At least once a month the quarters should be disinfected with air-slaked lime or a 5 per cent solution of crude carbolic acid. These precautions will be found valuable aids in the destruction of the various animal parasites, as well as a protection from some more serious troubles.

#### Prevention and Destruction of Vermin

Hogs often suffer very much from vermin. Lice are introduced from neighboring herds, and the losses in feeding are often severe, especially among young pigs, when death is sometimes a secondary if not an immediate result. When very numer-

#### ST. PAUL UNION STOCKYARDS COMPANY, SOUTH ST. PAUL, MINN.

##### Comparison of the Origin and Disposition of Livestock for October, 1914

States	Origin of Livestock Received					Total Cars
	Cattle	Calves	Hogs	Sheep	Horses	
Minnesota....	33342	7911	71916	19228	57	2344
Wisconsin....	7265	1266	13696	5605	2	494
Iowa.....	27	.....	157	.....	38	8
Iowa.....	27	.....	157	.....	38	8
Far South.....	102	104	.....	.....	.....	5
So. Dakota..	4067	110	7793	2223	42	284
No. Dakota..	16551	554	15303	12024	3	922
Montana.....	10839	91	1221	123096	46	999
Far West....	.....	.....	.....	14396	.....	53
Manitoba & NWT	7644	106	3404	1	.....	370
Far East....	.....	.....	.....	.....	.....	.....
Returned....	136	.....	.....	.....	.....	4
Totals.....	79973	10142	113 490	176753	188	5483
	Disposition of Livestock					
So.St.Paul P krs.	26834	5912	79613	31451	.....	.....
Cy & St. Butch	902	75	7058	136	.....	103
Outside Packers	2107	.....	22966	1879	.....	304
Minnesota....	11103	793	502	17768	90	432
Wisconsin....	2501	121	82	3921	12	105
Iowa.....	5474	271	411	5937	.....	206
Nebraska....	26	27	.....	.....	.....	1
Kans. & Mo..	113	.....	.....	.....	.....	4
So. Dakota..	2161	14	393	1030	.....	65
No. Dakota..	2775	341	.....	2953	.....	96
Mont. & West	5139	507	.....	.....	11	133
Far South....	.....	.....	.....	.....	.....	.....
Manitoba & NWT	34	.....	.....	203	44	4
Mich. & E. Can.	88	.....	.....	.....	.....	3
Chicago.....	19951	170	732	98099	1	1222
Ills.(ex Chicago)	4373	77	.....	1150	24	153
Eastern Points	1636	.....	.....	856	22	53
Acct. Serum Plants...	.....	.....	1693	.....	.....	.....
Returned.....	136	.....	.....	.....	.....	4
Totals.....	58509	2396	33837	133932	204	2888



ous, lice are a very serious drain on vitality, fattening is prevented, and in case of exposure to disease the lousy hogs are much more liable to contract and succumb to it.

Newly purchased hogs should be carefully examined for vermin, and they should not be turned out with the herd until they are known to be free from these pests.

When the herd is found to be badly infested with lice all bedding should be burned and loose floors and partitions torn out. Old boards and rubbish should be burned. The quarters should then be thoroly disinfected by spraying with one of the solutions mentioned. After disinfection, as in the case of a disease outbreak, everything about the place, inside and out, should be thoroly whitewashed.

The dipping vat may be used for the application of any of the various coal-tar dips on the market. The directions for mixing and using these dips as given by the manufacturers should be carefully followed. Dipping in a 20 per cent emulsion of crude petroleum is very effective not only against lice, but also against mange, with which hogs are occasionally affected. In mixing the dip a stock emulsion is first made in the following proportions:

Crude petroleum, gallons..... 4  
Water, gallons..... 1  
Hard soap (ordinary laundry soap) lb. 1

The soap is cut into shavings and dissolved in the water with the aid of heat. The crude petroleum is then added and the mixture vigorously agitated by shaking, churning, or pumping thru a spray pump. When thoroly mixed sufficient water is added to make 20 gallons of diluted dip. For larger quantities of dip proportionately greater amounts of the different ingredients are of course taken. The quantity of diluted dip necessary to fill a vat of the dimensions given above to a depth of 40 inches is 200 gallons. One hundred gallons will fill it to a depth of 267 inches. Soft water is necessary for a perfect emulsion.

#### MANAGEMENT OF LIVESTOCK

Farm Information Service, N. D.  
N. D. A. C.

Cheapest Gains from Young Pigs

The young pig uses less of its food for keeping up the body than the old hogs. In an experiment at the Wisconsin Experiment Station it was found that of 100 pounds of feed the 50-pound pig used 18 for keeping up its body and 82 for making growth. The 100-pound pig used 25 pounds

for keeping up the body and 75 pounds for growth. The 250 pound pig used 36 pounds of the 100 for keeping up the body and only 64 pounds for growth. The older the hog becomes the more it takes of its food to keep up its body and the less it uses for making growth.

This is true when the pigs are getting all the food they need. If they are fed only half the food that they need then most of the food goes for body up-keep and very little for making growth.

#### Screenings Beat Bran and Oats

In a sheep feeding experiment at the North Dakota Experiment Station it was found in a 10 weeks' feeding trial that 7 sheep fed screenings made 34 pounds more gain than another lot of 7 sheep fed oats and bran. And they used up 12 pounds more screenings than the other lot ate of the oats and bran. The average dockage of North Dakota wheat is more than two pounds a bushel. In 1914 the dockage will be at least 90,000 tons of screenings in the wheat alone, or enough to feed one million sheep thru a fattening period of 90 days.

#### 82 Cents per Bushel for Corn

This was the price received for corn fed to hogs at the North Dakota Experiment Station, when hogs sold for \$6.20. This makes a good return for corn. Corn with fair care will produce 25 to 50 bushels, which means \$21.15 to \$42.30 return per acre with hogs at \$6.20. When hogs are \$7.20, the returns are increased to 97 cents per bushel for the corn.

#### How the Hog Gains

Young animals make more pounds of gain from their food than when older. Dean Henry of Wisconsin gathered a lot of data on this and found that 38-pound pigs required 293 pounds of feed to make 100 pounds of gain, 78-pound pigs required 400 pounds of feed, 128-pound hogs, 437 pounds of feed, 174-pound pigs, 482 pounds, 226 pound pigs, 498 pounds, 271 pound pigs, 511 pounds, and for the 330 pound hogs it took 535 pounds of food to make the 100 pounds of gain, or nearly twice as much as for the 38-pound pig. This emphasizes the importance of pushing the hogs from the start in order to make the most economical gains. It has been found at the North Dakota Experiment Station that April pigs can be made to weigh 200 to 250 pounds by November 1st.



## Poultry Department



#### THE TRAP NEST

Michael K. Boyer

#### One of the Inventions that Gave Poultry Culture a Wonderful Boom

For years back, as far as I can remember, the laying quantities of a hen were measured by what the entire flock produced. It was not fair. Many a drone (a hen that did not produce enough eggs to pay her board) was allowed to remain in the flock and enjoy the same comforts, and the same feed, as did the hen that was doing phenomenal work.

The drone's species were thus propagated. When it came time to set hens, the eggs were gathered in a haphazard way, and the result was that each

year the eggs from drone-hens that positively refused to work during winter, were the foundation stock of the new generation. Is it a wonder that statistics fixed the average laying of a hen at from 80 to 100 eggs per annum?

I well remember the time when winter egg production was deemed more of a dream than a fact. It is different today. What has brought about the change? The Trap Nest.

Here we have a patent device, open to the view of the hen. She wants to lay. She examines the nest carefully. The door is open, it looks safe (hens are mighty cautious)—and she enters. Her body in some way touches some sensitive part of the nest, the door closes, and she is held a prisoner.

## 1900-C. C. DIBLEY & SON-1914

QUALITY—UTILITY—EXHIBITION

Single Comb Rhode Island Reds, Barred Plymouth Rocks, White Plymouth Rocks, Light Brahmas, Buff Wyandottes.

BIRDS OF HIGHEST QUALITY: Winners in the following shows 1913: Minneapolis and St. Paul, Minn., Fargo & Valley City, N. D. Mating list free. WOLVERTON, ROUTE 1, MINN.



But as she finds herself in a cozy, quiet corner, she calmly goes about laying her egg. She finishes, cackles, and awaits the appearance of some one to liberate her.

A band is fastened around the leg of each hen, and on each band there is a different number by which she is known. After having laid, the hen is taken off the nest, her number ascertained, and due credit given her on the egg. At night these numbers are noted on a record sheet.

Such a procedure gives us a good chance to raise the standard from 100 to 150 eggs as the average of our flocks. Is not such an improvement worth working for?

Besides, we can gain much information by the aid of the trap nest.

We can tell which hens lay small eggs, and which lay the large ones. We know the layers of badly-formed eggs, and those which turn out the regular egg-shaped product. We can distinguish the brown-egg layers from those that give us nothing but white-shelled eggs. We know which hen's eggs are as a rule fertile, and which hen gives us infertile eggs. We know how many times our hens become broody, and the sort of setters they prove to be. We know the age at which our pullets begin to lay, and if they are steady layers or not. We know when the hens stopped laying, due to the molting process. We know our winter layers as well as our summer layers.

Handling our hens, as we do in using trap nests, several times a week, we readily notice their condition. They may be too fat, or they may be too lean—either extreme being in need of treatment. If scales are forming on the legs, we notice it in the start and can nip the trouble in the bud.

The trap, nest, too, gives us a chance to arrest the egg eater. We catch her in the act. She becomes a good roast. To a great extent, the trap nest prevents the egg-eating habit, due to hens crowding on the nest and breaking eggs—the trap admits but one at a time.

Have I not given sufficient reasons for advocating the use of the trap nest in every farm-poultry house? They are the only guides to success. Where nests are conveniently arranged, it does not take more than five minutes to attend to 50 nests.

Trap nests have developed more good in poultry culture than has any invention in recent years. We are now able to secure 20 per cent more eggs with 25 per cent less hens, by breeding only from the cream of our flocks.

If five trap nests are allowed in every pen of 15 hens; or, in other words, a nest for every three hens in the pen—it is not necessary to look after the nests oftener than four times a day. Where there is a nest for every five hens, it is better to look after them every hour from nine o'clock in the morning to three o'clock in the afternoon. Very few eggs are laid before nine o'clock in the morning and after three o'clock in the afternoon. The hen that lays during the night, while on the roost, is generally out of condition.

There used to be an old-time theory that when a hen laid a small (pigeon-sized) egg, it indicated that she had reached the end of her litter, and her usefulness as an egg-producer had stopped for the season. The trap nest proved otherwise. My record sheet for last year shows that on May 7 hen No. 23 laid one of these small eggs. May 9 she laid an egg of normal size, and during the remainder of the month laid on an average every other day, and each time the egg was of good size.

The trap nest also proved that, as a rule, eggs do not hold the same shade of color thruout the season. Altho of a dark brown in the beginning, they become lighter in color as their yield increases—some coming pretty near a white. This is more true with heavy layers than with only ordinary ones. The pigment, or coloring matter, becomes weaker towards the end of the season.

Another fact has been shown: that in the case of heavy laying the eggs become smaller in size as their number increases. Eggs from hens are generally larger than those from pullets, principally on account of a less number being laid. However, there are exceptional cases where there is no difference in color or size, but the trap nest has proved that with the great majority there is considerable difference.

Trap nests do not consume as much time in their care as some writers would have one believe. Fifty traps can be attended to in from five to ten minutes, according to the convenience of location. If a trip is made five or six times a day—say, in the morning when opening up the house, then four trips between nine in the morning and three in the afternoon, and then again when closing the houses at night, there will in all be consumed not much more than a half hour each day. That half hour's work is more profitable than any hour's labor on the farm, and when once fully understood becomes an imperative order.

## FOR SALE

150 Choice Ferris Strain  
S. C. White Leghorn Cockerels at \$1.00 each.

MRS. WM. RYAN,  
Pekin, N. D.

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And prize-winning strain. Barred Plymouth Rocks, White Orpington Indian Runner Ducks, Silver Spangled Hamburgs, Silver Comb White and Brown Leghorns Stock and Eggs at Reduced prices.

F. C. MITCHELL CROOKSTON, MINN.

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White Wyandottes, Single Comb White Leghorns, Rose Comb Reds, hens 75 cts., pullets 85 cts., each. Fawn and White Indian Runner Ducks or Drakes, \$1.25 each. Mammoth Bronze Turkey Toms, \$4.00 each. Joseph Berg, R. 2, Box 12, Hendrum, Minn.



### Rose Comb Red Cockerels

Rose Comb Red Cockerels for \$1.50; and Fawn and White Indian Runners, \$2.50 per pair, if taken now.  
Mrs. Ira Heidlebaugh, Pleasant Lake, N. D.

### White and Columbian Wyandottes.

Light Brahmas, and S. C. White Leghorns Over 30 years a breeder. Stock and eggs for sale. Michael K. Boyer, Box 27, Hammonton, New Jersey.

White Rock and Columbia Wyandottes and Buff Orpingtons. Stock and Hatching Eggs in Season. O. A. Barton, Valley City, N. D.

Latta's S. C. Rhode Island Reds. First Prize Winners wherever shown. Stock and Eggs for Sale. J. G. Latta, Wheatland, N. D.

### Plum Grove Stock and Poultry Farm

Breeders of Red Polled Cattle, R. C. White Leghorns and Buff Wyandottes. Stock and Eggs for Sale. V. E. GRANT, Prop., Cuba, N. D.

FOR SALE: Pure bred Barred Plymouth Rock Cockerels and Mammoth Bronze Turkeys. Fine stock—Prices reasonable—Order early. Eggs in season.  
J. MAGNUSON, R. 3 Box 19 EDINBURG, N. D.

EGGS FROM BUFF ORPINGTONS AND S. C. RHODE ISLAND REDS at special low prices Bred to lay. F. M. PEZALLA, Cayuga, N. D.

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WHITE WYANDOTTES. If you want eggs from an early maturing, heavy laying, prize winning strain of White Wyandottes write me. I am developing a special laying strain by use of the trap nest. Prices reasonable. Write  
M. C. JAMES, Valley City, N. D.

Silver Campines and Buff Wyandottes. Great layers of large white eggs. Eggs and young stock for sale in season. E. K. Myhre, Valley City, N. D.

FOR SALE. M. B. Turkey Toms, raised from our Diploma Stock, \$5.00 and up; also Eggs from 26 varieties poultry. Catalog free.  
I. GUTTEN, Osakis, Minn.

Please Mention the N. D. F.  
When Writing the Advertisers.



## School and Home

My dear Miss Leader:

In looking over the course of study for December, I find that we are to consider legumes and root crops in the seventh grade, and the care of livestock in the eighth grade work. I hope that you have had the opportunity of collecting, during September, a number of varieties of legumes for your work. In this, as in any study where the laboratory method is possible, you can readily see the value of having before you, the object upon which you are working. In beginning your work it might be well for you to look up a good definition for the word "legume." Then you might mention the fact that according to N. D. Bulletin No. 46 there are over fifty species of legumes growing in the state, of which probably more than forty are native. All these legumes, as far as known, have, under suitable conditions, nodules growing upon their roots in which dwell bacteria that are able to take up nitrogen from the air and build it into compounds which are easily taken up by plants and used for food. The fertility of the virgin soil of our state is in great part due to these wild peas or vetches, lupines, prairie clovers, etc., which for ages have been growing upon our prairies.

The largest and most important family in this division of the plant kingdom, is the papilionaceae or pea family to which belong the clovers, alfalfas, vetches, peas, beans, and soy beans. All of these have the characteristic shaped flower of the sweet-pea, tho they differ greatly in color and size of flower.

It will be interesting to the pupils, probably, to learn some means of identifying the common cultivated clovers and alfalfas. Clovers are distinguished from the alfalfas by the fact that in the former, the three leaflets arise from the leaf stem at the same point, while in the latter, the middle one springs from a short stalk growing between the two side leaflets. Red, alsike, white, and crimson are the principal varieties of clover. The leaflets of the red are hairy and have a white dot in the center; the stem is high and rank growing, the plant being a heavy producer of palatable forage. The red is not, however, very resistant to acid condition of the soil, drought, or cold winters.

The alsike has a round pinkish head, rather small roundish leaflets

which are smooth with no white dot. This clover is a light producer, but has the advantage of being well adapted to wet or acid soils, and to dry or cold climates. It is also quite resistant to disease.

White clover has a white round head and rather roundish smooth leaflets with a white dot in the center. On account of its low growing habit, it is a poor producer of hay, but it is excellent for pastures and lawns, as it is perennial (red clover lasts but two years) and spreads very rapidly by means of underground stems.

Crimson clover is not common here. It has a long cylindrical head, scarlet in color, and leaflets which are roundish and hairy but have no white dot. It lives but one year and the forage is woody and hairy, making it very poor for stock feeding. It is used principally in the south for a cover crop and as a green manuring crop.

The clovers are much more convenient than alfalfa to use in the rotation since they can and should be sown with a nurse crop; they make a more rapid growth the first and second seasons and can be easily plowed under after two years. It is advisable to leave alfalfa on the land for seven or more years on account of the difficulty in getting it started, the loss of the use of the land the year it is sown, and the value of the crop which, in the case of alfalfa, continues the same for many years. Notwithstanding its poor adaptability to an ordinary rotation I am of the opinion that alfalfa is destined to do more for our state than is any other plant we are ever likely to grow here. Study it carefully. Get samples of its seed to plant in your school garden next June and encourage your pupils to try it at home. Let me refer you to an excellent treatise on this wonderful plant written by Superintendent Waldron of the Dickinson Substation, and published by the Agricultural College as Bulletin No. 25. Send for it.

I might mention in passing, six reasons why legumes are valuable:

1. Legumes help to balance the food rations of man and animals since they contain a high per cent of protein or muscle building substance, while the bulk of grasses and grains is starchy material, producing fat, heat and work.

2. Legumes draw up from the soil

by means of the deep tap roots, larger amounts of plant food such as phosphates and potash. A large part of this remains in the roots and lower branches and is plowed under in a condition in which it is easily used by other plants.

3. Since legumes have a higher per cent of nitrogen in their composition, the fertilizing effect of the manure from animals fed on them is greater than that found in the same weight of manure from animals fed grasses and grains. We do not always realize that barnyard manure has a value of at least \$2 per ton in increasing the crop yields of our land.

4. Legumes, by being able thru their nodule bacteria, to utilize nitrogen from the air, afford a cheap and convenient method of maintaining the nitrogen and consequently the humus of the soil. At the present time, nitrogen is to us here in North Dakota the most important plant food element.

5. The organic matter left in the soil is large in quantity and extends down deep by reason of the long roots of the legume which act as subsoilers. These roots rot easily and afford channels for air and water. The organic matter at the surface encourages the rain to soak in and stay and makes the soil loose and easy to work. By the way, the roots of legumes are the only economical subsoiling machines in use.

6. Legumes offer opportunities for a better system of rotation by introducing plants not subject to the same insect enemies and plant diseases as are cereals and the forage grasses.

Now possibly I should beg your pardon for treating the subject of legumes at such length in this necessarily short letter, but I feel that it is worthy of that amount of attention since we must eventually use them if we are to conserve the fertility of our soil and make money while we are doing it.

The potato is really a tuber but is classed as a root crop. It is a more or less important crop everywhere, but in North Dakota, especially in the Red River Valley, it is particularly so, our seed potatoes being known all over the United States for their quality. The early varieties, Early Rose, Irish Cobbler, Triumph, and particularly the Early Ohio are grown here. Later varieties are the Burbank, Carmen No. 3, Rural New Yorker, Pingree, and California Russet. The United States produces but six per cent of the world crop and stands fifth in potato production. Germany, European Russia, Austria-Hungary, and France preceding her in the order named. Send for N. D.



Bulletin No. 90 on potato culture; it will be very valuable to you.

One way to make the eighth graders work very interesting is to ask the pupils to make barn plans for the different classes of livestock. In doing this they will be applying many of the principles of care and management of livestock, such as housing, ventilation, cleanliness, feeding (silos are a part of the cattle barn), etc. Let each boy make a plan of his father's barn re-arranging it for greater convenience, cleanliness and comfort. North Dakota Bulletin No. 97 on "Barn Plans" will help you very much.

I hope that you will be able to interest not only your pupils but also their parents in these important features of agriculture.

Yours sincerely,

MERRITT N. POPE.

### BULBS MAY BE RAISED INDOORS

Not only are tulips and other bulbous plants attractive around the lawn in early spring, but they are also most satisfactory for indoor culture during the winter. They should be used in separate pots rather than in window boxes. Holland bulbs, such as the narcissus, tulip, and hyacinth, are practically the only plants that will flower satisfactorily in the house with ordinary care. About the only plant giving similar satisfaction is the begonia, according to the department's specialist, who has experimented with many varieties.

The essentials for growing bulbs indoors are that they shall become thoroly rooted before the tops are permitted to grow. This is done by planting the bulbs in soil either in pots or what florists know as "pans," which are shallow porcelain pots, or in boxes. These bulbs are then put in a cool place in the dark for a period of two to six or eight weeks, or even longer if desired. They should be left there until the roots are well started. The bulbs should then be brought into a slightly warmer place, with some light, for three or four days, and then gradually brought into greater warmth and full light. During all the period of growth the ground should be kept moist without being water-soaked.

Occasionally the roots should be examined to see whether or not the plant requires repotting. This is done by holding the hands over the top of the pot, inverting plant and all, tapping the edge of the pot so as to loosen it, then lifting the pot off. This can not be done unless the soil

is moderately moist. If the ball of earth is completely covered with roots the plant should be put in a slightly larger pot with new potting soil firmed about the old ball of earth by firming with the fingers, and then wetted thoroly.

Those who do not have gardens would do well to get potting soil of the nearest florist. If it is desired to prepare it, one part compost, one part good loam, and one part sand should be used. The compost should be cow manure and good turf rotted together for a year and turned two or three times in the interim. Well-decomposed leaf mold would answer as a partial substitute for the compost. One-twentieth part bone meal is a good addition to the mixture. If the loam is very heavy, containing much clay, its proportion should be somewhat diminished. If the loam is light and sandy, reduce the amount of sand or, in some localities, omit it altogether.

Narcissi take about five weeks to develop from the time they are brought into full light. Hyacinths take a longer time, and tulips about the same time as hyacinths. The Roman hyacinths come in a little less time, while the paper-white narcissus only takes about four weeks. It is hard to hold the paper-white narcissus for late winter. The hyacinths and tulips are hard to bring into bloom before February. The various forms of the yellow narcissus can be brought into bloom from December until the time for outdoor blooms by starting the bulbs early in the fall and bringing them into the light at intervals of a week or 10 days. For the earliest bloom it is desirable to get the bulbs started in October, and all of the bulbs should be planted before the middle of November.

Tulips require special care and attention. It is best to place the pots or pans in a box and cover the whole pot with at least 2 inches additional soil or ashes and leave them there until the bud has pushed clear above the pot; otherwise the blooms will be strangled in attempting to get out of the bulbs.

Instead of placing in the cellar, these pots and boxes may be buried in the open ground, the pots being covered with 4 inches of soil. In localities where the ground customarily freezes hard a heavy coating of manure should be added as soon as the first crust freezes over the bulbs. This layer of manure will prevent their freezing and will permit the bulbs to be removed to the house from time to time as needed.

The hyacinth, paper-white narcissus, and especially the Chinese sacred lily

are frequently grown in water. Special glasses for these bulbs may be purchased in which they may be successfully grown, or they may be placed in any attractive dish and supported by pebbles. The water should be kept so that it touches the bottom of the bulb.

### HOW TO PREVENT THE FLY

Specialists of the Department Agriculture have recently discovered that a small amount of ordinary powdered borax sprinkled daily on manure piles and garbage will effectively prevent the breeding of house flies. When applied about any of the breeding places of flies it will prevent the eggs from hatching. It does not kill the adult fly, but its thoro use will prevent any further breeding, the specialists say.

It was felt that if some means of preventing the breeding of flies near human habitations was devised, the diseases, such as typhoid and tuberculosis, spread by these filthy germ carriers would be greatly reduced. It was realized that no means for preventing the breeding of flies would come into common use unless it was such that the farmer could use it on his manure pile without impairing its usefulness for growing plants.

It can safely be stated that no injurious action has followed the application of manure treated with borax at the rate of ten ounces to eight bushels of manure. This amount is sufficient to kill the maggots and prevent all of the flies ordinarily breeding in eight bushels of manure from developing.

In the case of stables, the method is to sprinkle the borax in the quantities given above by means of a flour sifter or fine sieve. Most of the borax should be applied around the outer edges of the pile, as that is where the maggots congregate. The manure should then be sprinkled with two or three gallons of water to eight bushels of manure.

In the case of garbage, the borax should be thoroly sifted on in the dry form, in the proportion of two ounces to the can of garbage. This will not impair the value of the garbage as a food for hogs, as borax is not a poison.

### THE PURE SEED CONTEST Jan. 19th to 23rd

The North Dakota Improved Growers' Association Contest this year is going to be bigger than in previous years. Prizes will be equally as liberal as last year.



Arrangements have been made to have the judging all done before the show opens. This will make it possible to have a very much more satisfactory exhibit. The samples, when placed in position, will be graded in such manner as to show explicitly the quality of the seed which is exhibited and the amount of bushels for sale, etc.

Farmers who wish to exhibit seeds in the contest should apply for entry cards and forward their exhibit as soon as possible. The samples will be analyzed, tested for germination, and carefully stored for the contest exhibit.

Clean and grade up your seeds. Do not exhibit uncleaned grain. Get ready for the contest. Let us know much you have cleaned and graded for sale as seed. Send one full peck of any of the small grains or cereals, one-half peck of the ordinary forage seeds, as beans, millet, brome-grass and the larger grasses, two quarts of alfalfa seed, clover seeds, alsike and other small seeds; and smaller amounts of garden seeds. There will be good prizes for all sorts of seeds.

In case of corn, send to the Seed Laboratory 10 typical ears of the corn which you have selected and cured for seed. Each ear of corn should be carefully wrapped to prevent shelling, etc.

Of potatoes, send 10 typical tubers. The potatoes can be brought with you to the contest. They are the only product which will be judged after the show is ready. If you cannot come to the contest, send the ten tubers, well wrapped, by parcel post. All other entries, including the contest sample itself, must be at the Agricultural College on or before January 9th. Contest takes place Jan. 19th to 23rd, but time is necessary in order to analyze, test and judge.

Annual Banquet and business meeting will occur Jan. 21 at the Fargo Commercial Club.

Send for Entry cards, premium lists, membership blanks, etc.

Address: H. L. Bolley, Sec-Treas., N. D. Improved Seed Growers' Association, Agricultural College, N. D.

worth while for the average plant grower to spend any time with them. There are plants, however, such as some varieties of apples, raspberries, strawberries, evergreens, etc., that can be successfully grown if they are given the proper treatment, but which are not sufficiently well adapted to the region to grow and endure the winters if neglected.

While it is impossible for the plant grower to modify the surrounding conditions of the plants yet he can by various methods of cultivation and protection make it possible to grow these plants tho they are more or less unsuited to the region.

One of the principal causes of winter-killing in North Dakota, particularly in the western part of the state, is the drying out during the winter season. This is especially true of evergreens and more or less true of deciduous trees as well. The white pine and Norway pine, for instance, are both trees that will endure great extremes of cold but they cannot be

## Winter Protection of Plants

By C. B. Waldron, N. D. Experiment Station

One of the common complaints of those who attempt to grow fruit in the colder parts of the country, particularly in the prairie Northwest, is that of winter killing. The elements which determine the hardiness of plants are numerous and complex and not all together understood. Plants that will endure a certain degree of cold in one region are commonly winter killed in another having no lower temperature but in which some of the other conditions are different, particularly that of wind and moisture. Two plants that seem identical in their habits and internal structure will differ very much as regards their ability to withstand cold and trying conditions incident to the winter season. Winter killing may arise first from the inherent tenderness of the plants not suited to the region in which they are grown. Second, in the plants not maturing their wood in the shorter seasons at the North. Third, in the loss of moisture during the winter time, particularly in mild winter, and fourth from root killing. It is not worth while to try and grow in cold regions plants which are inherently too tender for that place. Plants so unsuited for North Dakota, for instance, as the Catalpa, black

locust, blackberries, and pear cannot be grown except under unusually favorable conditions and it is hardly

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grown in North Dakota under ordinary conditions for the reason that they lose their moisture during the winter. For that reason we have to select pines with a different type of foliage such particularly as the Bull pine and Jack pine. Even these are better if protected somewhat from the winds that tend to take the moisture from the trees. It has been noticed that evergreens suffer worse in a mild winter than in a cold winter for the reason that the loss of moisture is greater. Young evergreens should be grown upon the north side of three or four rows of ash or box-elders or willows in order to obtain this protection. It is also found that if they are planted upon the north slope that they will be more likely to pass the winter than if on the south slope. The same applies to fruit trees tho in a less degree.

Since the cause of winter killing of these trees is due to the extreme drying out it naturally follows that the soil should be moist before winter sets in. As a matter of fact it is a good practice to thoroly water the trees during the month of October so that the ground will not become dry during the winter. After the last watering it is also well to cover the ground with a heavy mulch of straw to prevent the escape of moisture. If the months, August and September, are unusually dry so that the trees seem to be suffering from drought they should be watered at that time as trees that go into the winter with a shriveled condition show less chance of going thru. They should not be watered to the extent of forcing a new growth as that would be sure to be killed the following winter. There is but little danger of this in ordinary seasons and ordinary soils, since the rainfall in North Dakota at that time is usually rather light. It follows, then, that the best treatment that trees can generally receive to prevent them from winter killing is to keep the ground moist and mellow from constant cultivation or by mulching thru the latter part of the summer. Allowing tall weeds or grass to grow about the tree is one of the surest ways to assist in the winter killing of trees.

In one of the orchards that I visited last week all of the trees came thru the previous winter in good shape, except five or six in the middle of the orchard where a patch of heavy sod had been allowed to form. If cultivation is impossible for any reason, it requires only a short time to put in a generous covering of old straw under each tree to a considerable distance and that will answer the purpose of cultivation so far as retaining moisture

and keeping down grass and weeds is concerned.

The question is often asked whether raspberries should be protected during the winter. It depends entirely upon the location in which they are grown.

If they are growing a few rods south of a tall wind-break so that they are covered with snow during the season it is not necessary to cover them, but if they are growing in an exposed place one should either protect them

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dy laying them down and covering with earth or straw or else not attempt to grow raspberries in that place. Some of the raspberries like the king, cardinal, and Minnetonka iron clad will occasionally go thru the winter without any kind of protection. We have yet to find the raspberry that will endure all of the winters with the canes exposed.

As regards the strawberry, while occasionally a bed comes thru the winter without any protection, it is not safe to take the risk. Even tho the vines live they are not so productive as they would have been if covered. A heavy covering is not necessary or advisable. Two inches of straw applied just as the ground begins freezing is sufficient unless the beds should happen to be in a very exposed place. With a light covering it is not necessary to remove it from the bed in the spring except to a slight extent immediately over the plant. They bear better if they are allowed to grow up thru an inch or so of straw in the spring.

There are a number of ornamental plants like the phlox, peony, iris, etc., that will usually pass thru the winter without protection. It is better, however, to see that the ground is thoroly wet about the plants in the fall and to cover them over with a foot or so of straw that should be removed early in the spring. It is quite as important to remove the covering from the plants early as it is to cover them. This applies especially to all trees and woody plants. The covering should be removed so that the soil can thaw out before the trees come into leaf. It is a mistaken idea that one can retard the growth of trees in the spring by keeping the ground frozen about the roots. The time of blooming, etc., depends upon the temperature of the atmosphere entirely and the earth should not be kept frozen after the tree begins growing.

There are many varieties of roses of the hybrid perpetual type that can be grown if they are laid down and covered in the fall just before the severe winter begins. The best covering for this purpose is chaff or leaves held in place by brush or a light frame of lath.

#### RAISING OF CANARY BIRDS PROFITABLE

The European War has interfered very seriously with the traffic in birds—canary birds particularly, which are imported annually to the number of about half a million. Most of these feathered songsters come from the Harz Mountains of Germany, the

chief breeding place of the world for canary birds, altho Belgium and England have also been considerable contributors. The cutting off of these almost only sources of supply emphasizes the appeal made 6 or 7 years ago by the Biological Survey of the Department of Agriculture that the people of America should breed their own canaries. The conditions in the United States are most favorable, home-bred birds are stronger and better than the imported ones which suffer by transportation and which must become acclimated, and the industry would mean between half a million and a million dollars annually to America.

Now or never would seem to be a very auspicious time to try the experiment, especially as it is the only way by which we will be able to supply the demand for canary birds. While the breeding of canaries for the trade is practically unknown on this side of the Atlantic, very little capital would be required to conduct the busi-

ness as it is carried on abroad where the women and children of native families add an interesting occupation to their ordinary household duties and secure satisfactory returns in cash. The mountain regions of the Southern States would seem to furnish almost ideal conditions for such an industry, which besides being lucrative, possesses the added advantage of substituting

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the canary for such wild species as the mocking bird, the cardinal, and other birds whose advantage to agriculture is too great to make it desirable to interfere with their natural reproduction.

### SCIENCE FOR GROUPS OF FARM WORKERS

A plan whereby ten or more farmers or farm women can form home classes in agriculture or domestic science and receive the textbooks, lectures, lantern slides, laboratory and cooking equipment necessary to conduct them has been devised by the U. S. Department of Agriculture in co-operation with Agricultural Colleges of certain states.

The object of the plan is to make accessible at home, to men and women who have not the time or means to attend the regular courses at the colleges, practical short courses in agriculture and home management specially adapted to their districts. These courses, which will consist of 15 to 20 lectures, and will consume five or more weeks, can be arranged to suit the spare time and convenience of each group of people.

The courses to be offered at first are poultry raising, fruit growing, soils, cheese manufacturing, dairying, butter making, and farm bookkeeping; and for the women especially, courses in the preparation, cooking and use of vegetable and cereal foods. The Department will supply lectures and lantern slides covering these subjects, and the states which have agreed to co-operate in the plan will lend to each group laboratory and cooking apparatus valued at \$100 and a reference library. The textbooks and lectures will be made so complete that each group can safely appoint one of its members as study leader to direct the work of the course.

When a group has decided to take up the work, the state which co-operates sends an agent with the Department's representative to organize a sample class and assist the leader

whom they elect in laying out the work and in showing him the best methods of procedure. The classes commonly are held from 8:00 to 12:00 in the morning and from 1:00 to 4:00 in the afternoon, two or three days each week. The sessions are not held every day, so that the members will have time to attend to their farm duties in between the sessions, as well as before and after the instruction period. The classes meet commonly at the most convenient farm house. During the morning hours, textbook work is done. In the afternoon laboratory work is conducted, and the women who have elected to take the domestic science courses have practical lessons in cooking.

As soon as a class is established, the state organizer withdraws to start a class in some other district. The work thereafter is left in charge of the leader, who receives assistance by mail from the college or the department in carrying on the work.

As there is no regularly paid instructor, classes can be carried on all over the state as rapidly as the college organizer can visit the groups, and as quickly as the laboratory sets supplied by the college become available. The local leader will preside during the reading of the lectures and references, for which full texts and lantern slides are supplied by the Department. He will also be responsible for the laboratory equipment. Every one who completes the course will receive a certificate from the State College.

Not all of the states have yet agreed to co-operate in this plan. Last winter experiments along these lines were carried out successfully in Pennsylvania, and this has stimulated an interest in the method in other states. In one of the Pennsylvania classes more men applied than could be accommodated, and all of the 20 men and 15 women who began the course completed it. Pennsylvania is now arranging for more classes, while Massachusetts, Michigan, Vermont and Florida expect to take up the work. Other states such as Maine, New York, New Jersey, and Delaware have signified their willingness to co-operate.

Ordinarily a college in a state usually applies to the department seeking its co-operation, when sufficient interest has been shown in the plan in several communities where ten or more people have sought the instruction. For financial reasons, certain colleges are not so able to engage in the work as are others.

The advantage claimed for the new home courses with local leaders and laboratory equipment over the ordi-

nary correspondence courses is that only a small percentage of those who take the individual correspondence course finish it. Studying in a group, with laboratory work and a leader, seems to stimulate the interest and add a social feature which lead the members of the group to follow the work conscientiously and complete it. Experiments with free correspondence courses show that while many individuals gain advantage from them, many others, because the material is furnished free, do not feel the same obligation to complete them as they do when they pay a substantial sum of money for the instruction.

### HUMAN HEALTH AND THE FOOT-AND-MOUTH DISEASE

#### The Danger of Contaminated Milk Spreading the Disease Overcome by Quarantine and Pasteurization

The anxiety that has been expressed in several quarters in regard to the effect upon human health of the present outbreak of the foot-and-mouth disease is regarded by Government authorities as somewhat exaggerated. The most common fear is that the milk supply might become contaminated, but in view of the precautions that the local authorities in the infected areas are very generally taking, there is comparatively little danger of this. Milk from infected farms is not permitted to be shipped at all. The only danger is, therefore, that before the disease has manifested itself some infected milk might reach the market. For this reason, experts in the U. S. Department of Agriculture recommend pasteurization. As a matter of fact, however, pasteurization is recommended by the Department anyway for all milk that is not very high grade and from tuberculin tested cows.

It has been demonstrated by experiments which have been made in Denmark and Germany that pasteurization will serve as a safeguard against contagion from the foot-and-mouth disease just as readily as it does against typhoid fever, but in any event it must be thoroughly done—the milk must be heated to 145 degrees Fahrenheit and held at this temperature for 30 minutes.

In this country the foot-and-mouth disease has been so rare that there are few recorded cases of its transmission to human beings. In 1902 a few cases were reported in New England, and in 1908 in a few instances eruptions were found in the mouths of children which were believed to have been caused by contaminated milk. In both of these outbreaks, the sale

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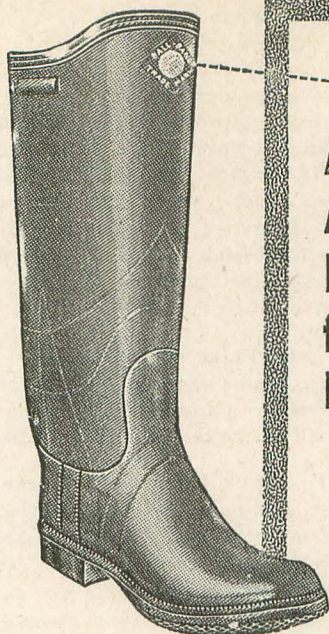


of milk was stopped as soon as the disease was found among the cattle. As long, therefore, as the disease can be confined by rigid quarantine to certain specified areas, the danger from this source is very small. Should the pestilence spread all over this country and become as general as it has been at various times in large areas in Europe, the problem would become more serious. Under any circumstances, however, pasteurization would be an efficient remedy. Where pasteurization is not possible, and where there is any reason to suspect that the disease may exist, the precaution of boiling milk might be advisable. Simple directions for pasteurizing milk at home, however, are contained in Circular 127 which will be sent free on application to the U. S. Department of Agriculture.

Cows affected with the malignant form of the disease lose practically all of their milk. In mild cases, however, the decrease may be from one-third to one-half of the usual yield.

The appearance of the milk also changes. It becomes thinner, bluish, and poor in fat. When the udder is affected, the milk frequently contains coagulated fibrin and blood, so that a considerable sediment forms, while the cream is thin and of a dirty color. These changes, however, occur only when the disease is in an advanced stage and, as a matter of fact, the disease is not permitted to pass into an advanced stage, as any stricken animal is at once slaughtered.

Men who come in contact with diseased animals may also become infected. In adult human beings the contagion causes such symptoms as sore mouths, painful swallowing, fever, and occasional eruptions on the hands, finger tips, etc. While causing considerable discomfort, however, the disease is rarely serious. Where it is very prevalent among animals, some authorities believe that it is fairly general among human beings, but that the disturbances it causes are usually so slight that they are not brought to the attention of the family physician. There is, however, a very good reason for every one giving the diseased animals as wide a berth as possible, namely, that otherwise they may easily carry the disease to perfectly healthy herds. Federal inspectors engaged in the work of eradicating the pestilence are thoroly equipped with rubber coats, hats, boots and gloves, which may be completely disinfected; and others who lack this equipment are strongly urged not to allow their curiosity to induce them to become a menace to their own and their neighbors' property.



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The disease, in short, is dangerous because of the loss that it occasions to property, and not because of its effects upon the health of mankind. At present all infected herds are being slaughtered as soon as they are discovered, the carcasses buried, and the premises thoroly disinfected. Until all danger of infection has been removed in this way, the local authorities quarantine the milk.

Those who wish additional precautions are recommended to use pasteurized milk, but as has already been said, this recommendation holds true whether or not there is any fear of the foot-and-mouth disease.

## THE HOUSEWIFE'S EXCHANGE

### Rat Exterminator

Sulphur sprinkled about in places haunted by rats or mice, will rid your house of the pests.

### To Preserve Cheese

To preserve and keep moist a large cheese, take paraffin paper and spread it with butter. After each cutting of the cheese press the buttered paper closely to the cut places, wrap carefully and keep in a dry place. The cheese will keep moist and delicious for weeks.

### Renovating Window Shades

Window shades that have become cracked and broken can be renovated by laying them on the floor or some flat surface and painting them with ordinary oil paint bought at any hardware store in one-half or one-pint cans.

Paint one side and let it thoroly dry before touching the other side. This treatment preserves the shades and makes them last for years. Use paint as near the same shade as your blinds as you can get it.

### To Clean Carpet Sweepers

Keep a coarse-toothed comb for use on your carpet sweeper. It will prove excellent for cleaning out tangled hair-combings, threads, lint, etc., which have become matted into the bristles.

### A Kitchen Mat

A rubber doormat or one of the cheaper coco fiber or heavy rope mats is elastic to the step. For that reason it is helpful to have one in the kitchen to stand upon when washing, ironing or washing dishes. You will be surprised to find how much less tired you get after standing for several hours at work.

### An Emergency Chest

Being the wife of a workingman I cannot afford a very large supply of towels and bed linen. But I have an emergency chest in which I keep a change of sheets and pillow slips, inexpensive, but neatly made and beau-

tifully laundered, a half-dozen plain white towels, specially marked, two wash cloths, two bath towels, a cake or two of good toilet soap, and a can of talcum powder. These are used only in the guest room, and I never have to ransack the house for towels or bed linen when an unexpected guest arrives. I am also relieved of the embarrassing experience of having a guest arrive and find me without a change of linen in the house.

### In Place of Beeswax

Use common laundry soap in place of beeswax on ironing day, and your iron will be neither rough nor sticky.

### To Pluck Ducks and Geese

First pull out coarse tail and wing feathers. Of course the fowl should be picked dry—never scald water-fowl. Finish by sprinkling powdered rosin thru the down and remaining small feathers. rub close to the skin, and the down and feathers will peel off in rolls, leaving the skin perfectly smooth. Wash all traces of rosin away in cold water before cutting fowl open.

### To Measure One's Own Skirts

An experienced dressmaker tells of an easy and sure way to measure the length of one's own dress-skirts. The variation in the length of a dress is always between the waistline and fifteen or twenty inches below. So take a piece of chalk, (colored chalk for light goods) stand by a table and mark a line all around the skirt at

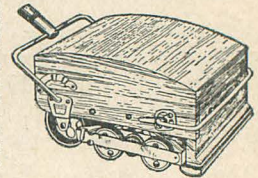
the height of the table. Care must be taken that the body is held straight all the time. Then take off the skirt and with the yard-stick measure a line the desired number of inches below the chalked line. You can then cut or trim the bottom of the skirt at this second line and your skirt will be perfectly even all around.

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Your simple word that you'd like to try this "Torrington Regent" brings it by first Parcel Post. This ROLLER BEARING, triple suction combination sweeper and vacuum cleaner gets the fine trodden-in dirty dirt that a broom can't touch. Brush is adjustable to varying length nap carpets or can be removed at a finger touch and machine operated as straight vac. Beautiful mahogany finish, with heavily nickel-plated trimmings. Guaranteed for 5 years:

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right and left. Quick sales, immense profits. Look at these men: Smith Ohio, got 18 orders first week; Meyers, Wisc. \$250 profit first month; Newton, California, \$50 in three days. You should do as well. 2 SALES A DAY MEANS \$300 A MONTH. The work is very easy, pleasant, permanent, fascinating. It means a business of

your own

### DEMONSTRATING TUB FURNISHED

Little capital needed. I grant credit—Help you out—Back you up—Don't doubt—Don't hesitate—Don't hold back—You cannot lose. My other men are building houses, bank accounts, so can you. Act then quick, SEND NO MONEY. Just name on penny post card for free offer. Hustle!

**H. S. ROBINSON, President,**

942 Factories Bldg.  
Toledo, Ohio



## Seasonable Receipts

Edited by Mrs. Sadie Baird.

### Smothered Beef

Cut stew beef into small pieces. Place some beef "drippings" in a frying pan and when smoking hot add the meat, turning it until it is seared on all sides; add salt and pepper and dredge well with flour, then add a cupful of boiling water and cover closely and keep it simmering until the meat is very tender. A little more water, enough to keep it from burning, may have to be added from time to time. When done have ready half a can of tomatoes and turn them into the gravy and pour all over the meat.

### Baked Meat Dumplings

Make a dough as for shortcake, roll out and cut in squares. Take one cupful of cold boiled ham or other meat, one cupful of bread crumbs, one cupful of hot mashed potatoes, two eggs, pepper, salt and butter to season. Beat all well together and place one large spoonful in the center of each square, bring the corners all together in the center and pinch them so they will hold. Bake in a quick oven.

### Scalloped Turkey

Make one cupful of sauce, using two tablespoonfuls of butter, two tablespoonfuls of flour, one-fourth teaspoonful of salt, a few grains of pepper and one cupful of stock (obtained by cooking in water the bones and skin of a roast turkey). Cut the remnants of the cold roast turkey in small pieces to make one and one-half cupfuls. Sprinkle the bottom of a buttered baking dish with seasoned cracker crumbs, add the turkey meat, pour the sauce over it and sprinkle with the buttered cracker crumbs. Bake in a hot oven until the crumbs are brown.

### Steamed Winter Squash

Cut in pieces, remove the seeds and stringy portion and pare. Place in a strainer and steam over boiling water until soft. Mash, and season with butter, salt and pepper. If lacking in sweetness, add a small quantity of sugar.

### Steamed Indian Pudding

Place in a double boiler one quart of milk, allow it to come to a boil, add one cupful of corn meal gradually, stirring constantly. Boil for about one-half hour then add one cupful of molasses, one-half cupful brown sugar, one teaspoonful of salt, one teaspoonful ginger, one-half teaspoonful of cinnamon and two well-beaten eggs.

Stir until very smooth, then add one-half cupful each of raisins and currants. Pour into a greased mold and steam three hours. Serve with whipped cream, sweetened with maple sugar, or with a liquid lemon sauce.

### Cranberry Punch

Prepare a rich cranberry sauce, then press it thru a fine sieve, in order to remove the seeds. For two pints of the sauce soak in cold water and dissolve in hot water, one tablespoonful of gelatin. Add two cupfuls of sugar and the juice of two lemons. Place in a freezer and freeze very stiff. Serve piled high in long-stemmed glasses with a candied cherry in the top of each.

### Cranberry Jelly

Pick over and wash a quart of cranberries; drain off the water and put the wet berries in a saucepan with a scant teaspoonful of soda and pint of water. Place on a brisk blaze and as soon as the first berry pops drain off the water, this removes any bitter taste they might have. Return the berries to the fire with a cupful of water, cover and stew until tender; then drain them thru a sieve, return the pulp to the saucepan and boil a few minutes, add two cupfuls of sugar, stir, and boil just long enough to melt the sugar. Rinse a mold with cold water and sprinkle with granulated sugar. Pour the cranberries, when nearly cold, into the mold and set in a cool place to become firm. This should be made the day before using, as it requires longer to jell, but is prettier than the sauce.

### A Boiled Dinner

Boil two pounds corn beef in cold water one-half hour to freshen. Throw away liquor; cover with hot water and cook till tender. Three-fourths of an hour before dinner time, put in the kettle six potatoes, six carrots, one small head of cabbage (cut in quarters) six parsnips and six turnips, six onions. Put the meat in the center of a large platter and arrange vegetables around it.

### Beef Loaf

Two pounds chopped beef, one pound veal, one-fourth pound salt pork, three soda crackers, two eggs, salt, pepper, summer savory and sage.

### Noodles

One egg slightly beaten, a little salt, desert spoon of water. Mix as solid as possible with flour; roll to

paper-like thinness. Dry one hour; roll up and shave off thin slices; put them in soup, lightly, and boil ten minutes.

### Baked Cheese

Take one and one-half cups grated cheese, one-half cup bread crumbs, one cup milk, one egg beaten light, a little red pepper and salt to taste. Put in buttered tin and bake fifteen minutes in quick oven. A good way to use up small dry pieces.

### Savory Potatoes

Six potatoes, one onion, four slices fat bacon, milk, salt and peppers. Cut two slices of bacon in small pieces and place in bottom of baking dish, and over it slice a layer of potatoes and half the onion. Add two more slices of bacon and the rest of the vegetables. Season and cover with milk. Cover dish and bake one-half hour. Remove cover and finish baking.

### Graham Bread

Two cups sweet milk, one cup sour milk, two cups cornmeal, one cup white flour, two cups graham flour, one cup brown sugar or molasses, one teaspoon soda. Steam three hours, or two hours on oil stove; then put in the oven fifteen minutes.

### Sweet Raisin Bread

Two cups bread sponge, one-half cup milk, one egg, two tablespoons melted butter, four tablespoons sugar, raisins. Knead down twice before making into loaves.

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